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ASCLEPIAS CORNUTI, DECAISNE.

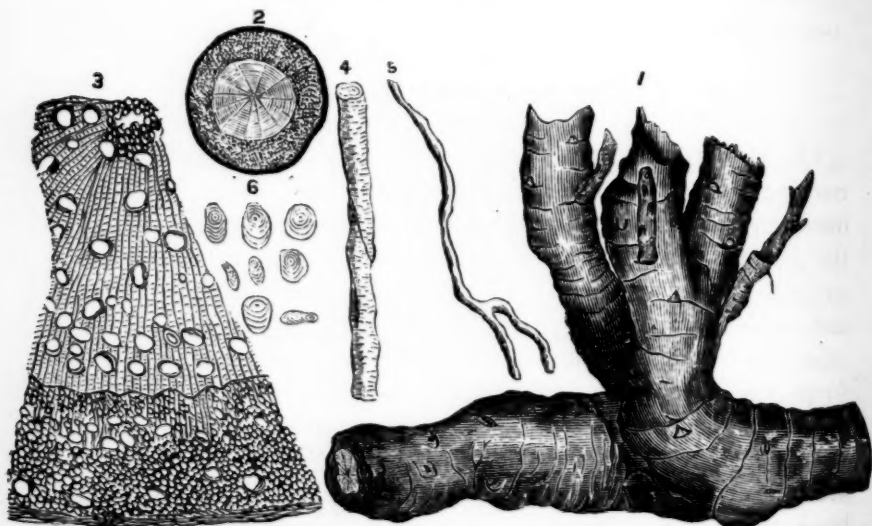
BY WALTER LIPPINCOTT HINCHMAN, PH. G.

From an Inaugural Essay.

The rhizome of this plant is long and comparatively slender, reaching from one to six feet in length, from one-half to one inch in diameter, and runs horizontally about six inches below the surface of the ground. It is thickened at intervals of ten or twelve inches, where the overground stems shoot out, otherwise it is uniform in size and at the end has generally three rootlets. It has a thick bark, externally brown, the interior white, and contains a number of laticiferous ducts, somewhat scattered, but principally placed in two irregular lines. In drying the bark shrinks very much and is finely wrinkled longitudinally, and somewhat fissured at intervals, leaving the wood exposed. The wood, of a yellow color, is hard and brittle, breaking with a resinous fracture; it contains a large number of medullary rays and also ducts, which are visible to the naked eye. The annexed drawing has been made by Mr. F. L. Slocum. The rhizome has a disagreeable, nauseous taste and a slight odor. The fresh rhizome in air drying loses 70 per cent., the air dry in complete drying 10 per cent., and when completely dried yields 6 per cent. of ash.

A portion of the powdered drug was thoroughly exhausted with petroleum benzin. The benzin was partially distilled off and the remainder allowed to evaporate spontaneously. This left a sticky, yellow extractive, overlaying a fixed oil; these were separated. The oil has a fine yellow color, a bland taste and the odor of the drug. The sticky extract was washed with water and then exhausted with warm 95 per cent. alcohol. This alcoholic solution was concentrated with a low heat and set aside. Upon cooling, yellow, wart-like crystals formed. By numerous solutions and recrystallizations in alcohol these were obtained white. They are wart-like, odorless and tasteless,

iridescent in the sunlight, volatilized at a low heat, leaving no residue, have no reaction on litmus paper, are very soluble in chloroform, soluble in benzin, ether and alcohol, insoluble in water. In contact with strong sulphuric acid and bichromate of potassium they give a green color. With strong sulphuric acid and chlorinated lime they give at first a brown color, but on standing a short time this turns to a purple.



ASCLEPIAS CORNUTI.—1, Portion of rhizome. 2, Transverse section, natural size. 3, Transverse section, magnified. 4, Bast fibre. 5, Lacticiferous vessel, 6, Starch granules.

These crystals may also be obtained by exhausting the sticky benzin extract with ether, but on account of the fatty matter which ether takes up it is difficult to obtain them pure. Another, and probably the best method, is to percolate the drug directly with alcohol, concentrating the tincture and setting aside that crystals may form. The yellow crystals thus obtained are best purified by dissolving in a mixture of chloroform and alcohol, shaking with animal charcoal, filtering and setting aside for spontaneous evaporation, washing with diluted alcohol and drying in a cool place. In all three of the above methods it is important that the least possible amount of heat should be used.

The benzin extract, after having been exhausted with alcohol, ether, water and dilute hydrochloric acid, consists of a yellow, sticky tenacious substance, readily soluble in carbon bisulphide, chloroform and

benzin. When heated it gives off the disagreeable odor of burning caoutchouc. When mixed with a small proportion of sulphur and heated the yellow color changes to a dark brown, and it then has the elasticity of ordinary India rubber.

The drug, after exhaustion with benzin, was next treated with 95 per cent. alcohol. From the resulting tincture the alcohol was distilled off, leaving a ruby-red liquid of a syrupy consistence, having with litmus an acid reaction. It has an intensely bitter taste, reminding one of gentian. The liquid, on being slowly mixed with a large bulk of water, yields a precipitate which, after separation and washing, is odorless and tasteless and has the characteristics of a resin. The watery solution left after precipitation of the resin was filtered and boiled to expel the alcohol; tested with solution of gelatin a flocculent precipitate was thrown down, proving the presence of tannin, and after filtering Trommer's test liquid was reduced, showing the presence of glucose. The remainder of the watery solution was evaporated and left a very bitter extractive having an acid reaction. The bitter principle was not isolated.

The drug, after exhaustion with benzin and alcohol, was next treated with hot water; alcohol precipitated gummy matter from the decoction, and compound tincture of iodine gave a deep blue color, indicating starch. The ash, on examination, showed the usual constituents. On distillation of the drug a volatile oil was obtained, but in such a small quantity that it could not be examined. It is probable that the fresh rhizome contains a volatile acrid principle which is poisonous to the skin. In collecting and slicing it the hands are often severely poisoned, small blisters forming, which cause an intense itching.

In conclusion, we find the rhizome to contain the following: *Asclepion*, caoutchouc, fixed oil, tannin, glucose, a bitter principle, gum, starch, volatile oil and the usual ash constituents.

***Thapsia garganica*, Lin.**, nat. ord. *Umbelliferae*, grows in Algeria and its root is largely employed as an excellent revulsive. Renard and Lacour-Eymard state that the active principle is contained mainly in the bark of the root. They consider the tincture as preferable to the plaster and ointment.—*Rép. de Phar.*, May, pp. 216-219.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Japanese and Chinese Aconite Tubers.—Dr. A. Langgaard describes seven kinds of aconite tubers which are met with in the Japanese drug stores and which are mostly used externally, rarely internally, and are perhaps also used in the preparation of the sesso arrow poison. The origin of these tubers has not been ascertained yet. *Aconitum lycoctonum*, *Lin.*, var. *flor. ochroleucis*, *Savatier*, is regarded by botanists as identical with *Ac. japonicum*, *Thunberg*, and *Ac. Fischeri*, *Reich.*, with *Ac. chinense*, *Sieb.*; these plants are known in Japan as *reis-in-so* and *tori kabuto*, the latter name meaning "bird's helmet," in allusion to the shape of the flower. A third species, *Ac. uncinatum*, *Lin.*, is known as *hana-dzuron*. The tubers are not derived from many different species, but are assorted according to size and prepared in various ways, by maceration in vinegar or children's urine, by pickling, drying and interring, their appearance and properties must be considerably modified. With the exception of *kusa-usu*, they are derived from carefully cultivated plants.

1. *Dai-bushi* is imported from China, where it is known as *Fu-tze*, in a pickled condition. The tubers are large, heavy, napiform, of a dingy gray or gray-brown color, deeply wrinkled, mostly with the shriveled bud present, with small warty protuberances and with scars of the detached rootlets; 35 to 55 millimeters long; the largest diameter up to 30 mm. thick; weight 6.7 to 16.6 grams; attract moisture, are tough but may be cut; taste saline, then burning. A transverse section is of a dingy brown-yellow color and occasionally shows irregular curved lines which by the Japanese are likened to the convolutions of the brain; mostly, however, a circle of fibrovascular groups is seen, each group being furnished with a circular cambium, 4 or 5 fibrovascular bundles and a central pith. These tubers yield 15 per cent. of alcoholic extract.

2. *Sen-uzu* comes from the northern part of Nipon and agrees with Hanbury's *chuen-woo* of China. The tubers are smaller than the preceding, roundish or conical, gray, smooth or somewhat finely wrinkled, above depressed, often bearing the remnants of a bud, on the sides with small wartlike protuberances, deprived of the radicles; 15 to 40 mm. long; 30 mm. and less thick; weight 2.5 to 7.4 grams; very hard, cut with difficulty; upon transverse section white and

mealy, after soaking grayish- or yellowish-brown; the cambium line in the upper part of the tuber more or less five- to seven-rayed, in the lower part elliptic or circular. In some tubers the cambium line is not rayed but angular, or is wanting altogether, and in the broad inner bark are a number of small starlike vascular bundles, placed in a circle; the latter agree with the secondary tubers of the plant yielding *dai-bushi*. Two very poisonous alkaloids have been obtained from these tubers, but not further investigated. Yield of extract 4.92 per cent.

3. *Katsuyama-bushi*.—These are Japanese tubers, the largest of which resemble the small *dai-bushi*. They are covered with an earthy saline incrustation, are conical or napiform, dingy gray or gray-brown, with scars of detached rootlets, deeply wrinkled, soft, tough, but the bark easily removed; length 18 to 38 mm.; weight 4.1 to 14.7 grams; almost always worm-eaten. Upon transverse section the color is yellowish; the cambium ring circular, wavy or occasionally radiating; the pith large. Yield of alcoholic extract 11.57 per cent.; nearly inert.

4. *Shirakawa-uzu*.—These tubers are elongated, somewhat napiform, often flattened and bent, truncately cut off, with scars of radi-
cles, warty, longitudinally wrinkled, dirty gray, covered with an earthy saline incrustation, soft, tough, very hygroscopic; taste saline, afterwards burning; upon the transverse section grayish-white, the cambium with numerous obtuse rays; the pith large, deeper gray. In some tubers the pith is smaller, the cambium few-rayed and surrounded by a circle of fibrovascular groups similar to those of *dai-bushi*. Yield of extract 22.32 per cent. Two alkaloids are present, one crystallizing from ether.

5. *Kusa-uzu*.—These are 1.5 to 3.5 cm. long, 0.8 to 1.5 cm. broad in the thickest part, weight 0.8 to 1.5 gram; they are small, napiform or conical, pointed or rarely obtuse, above flattened, somewhat curved, gray-brown, much wrinkled longitudinally and transversely, rarely smooth, often with stem remnants, scars of rootlets and worm-eaten; transverse section white or yellowish-white, mealy, occasionally horny and gray; bark $\frac{1}{4}$ to $\frac{1}{3}$ diameter; cambium line dark, mostly somewhat radiating, or rarely roundish with distinct medullary rays and in the bark numerous stone cells. Yield of alcoholic extract 8.14 per cent.

This aconite is extremely poisonous, the properties depending

mainly upon an alkaloid, readily crystallizable from ether, for which Paul and Kingzett ascertained the formula $C_{29}H_{43}NO_9$, while Wright and Luff (1879) called it *japaconia*, having the composition $C_{66}H_{88}N_2O_{21}$, and on being boiled with alkalies found it to split into benzoic acid and a new base, $C_{26}H_{41}NO_{10}$. The alkaloid is a stronger poison than aconitia and pseud-aconia, possesses strongly irritating properties and destroys life by paralyzing the heart muscles.

The tubers of an aroidea, known in Japan as *haku-bushi* (white bushi) and in China *teh-fu-tsze*, bear some resemblance to the kusa-uzu, but are readily distinguished by their light weight and by the transverse section.

Sen-uzu and kusa-uzu yield the most poisonous extracts; then follows dai-bushi, next shirakawa-uzu and finally, as the least active, katsuyama-bushi.—*Archiv d. Phar.*, 1881, March, pp. 161-185.

Lonchocarpus Peckolti, Wawra. Nat. ord. Leguminosæ, Papilionaceæ, Dalbergiæ. In Brazil many poisonous plants, like several species of *Serjania*, an araceous plant, etc., are called *timbo*; the above named is often distinguished as *timbo boticario*. It is a small tree, 4 or 5 meters high, flowers in July and ripens its fruit in November. The roots are often of the size of a child's arm, externally light brown, the bark internally yellowish and easily separated from the wood, which in small roots is white and in thick roots deep yellow. The fleshy bark is employed and has in the fresh state a penetrating musk odor, similar to that observed near poisonous serpents and crocodiles.

Dr. Peckolt obtained from the fresh bark 0.1588 to 0.1727 per cent. of volatile oil, having a strong repulsive musk odor. Sulphuric acid colors it orange-yellow, then yellowish-brown. Hydrochloric acid colors red-brown, bluish, light blue, on boiling paler, on cooling deep indigo blue. The decoction, after precipitation with lead acetate and evaporated, yielded to ether 10 per cent. extractive, nearly inodorous, but of repulsive taste, producing intoxication. The residue was partly insoluble in alcohol and consisted mostly of saccharine extractive. The bark contains also albumen, starch, three resins (α resin, soluble in ether and insoluble in alcohol; β resin, soluble in alcohol and ether, dark brown, soft; and γ resin, crystalline floccules from boiling alcohol), two resin acids, a crystalline acid, lonchocarpic acid, and also a volatile poisonous alkaloid, *lonchocarpina*, which is light brown, oily, of a faint musk-like stupefying odor, insoluble in water, easily

soluble in acidulated water, ether and alcohol, the hydrochlorate very deliquescent.

In 1,000 grams of the root bark were found volatile oil 1·727, lonchocarpina 0·718, lonchocarpic acid 1·285, fatty acid of musk odor 11·500, wax 0·171, bitter principle 1·794, α resin 7·967, β resin of musk odor 4·578, γ resin crystalline 2·000, α resin acid of faint musk odor 2·100, β resin inodorous 2·106, extractive of musk odor 0·206, albumen 21·484, starch 45·312, saccharine extractive 29·023, tartaric and malic acids and salts 2·182, dextrin, inorganic salts, etc. 28·212, moisture 725·399, cellulose 112·236 grams.

Chernowitz and Langgaard have erroneously stated this bark to be derived from Paullinia and Serjania. The bark is used in Brazil only externally in hepatic affections, splenitis, furuncle, etc., in the form of cataplasm prepared from a decoction of 30 grams to 500 grams of water thickened with manihot starch. Also in the following forms:

Oleum lonchocarpi.—Timbo bark 10 grams, stronger alcohol 10 grams, groundnut oil 40 grams. Digest and filter.

Tinctura lonchocarpi.—Timbo bark 1 p., stronger alcohol 5 p.

Unguentum lonchocarpi.—Alcoholic extract of timbo 10 grams, tincture of timbo 5 grams, lard 70 grams.

Emplastrum lonchocarpi.—Beeswax 30 grams, Burgundy pitch and Venice turpentine each 10 grams, cocoanut oil 30 grams. Melt together and add alcoholic extract of timbo and powdered timbo bark each 15 grams.—*Zeitschr. Oest. Apoth. Ver.*, Nos. 13, 14.

Botanical Sources of Tonga.—This remedy has been introduced from the Feejee Islands, where it is highly valued in neuralgia. From specimens sent by Mr. R. L. Holmes and identified by Baron Von Mueller, it appears to consist of two plants. One, called by the natives "aro," is *Premna taitensis*, D. C., nat. ord. Verbenaceæ. In open, dry places it remains shrubby and flowers while quite small, but near water courses it becomes a tall tree, the timber of which is used in building, the inner bark being the part used medicinally. The other plant, known as "nai yalu" or "walu," is *Raphiodophora vitiensis*, Seemann, nat. ord. Araceæ. It is a creeper, with the stem of the size of a quill, growing freely in sheltered places, climbing over stones and up on trees, when the stem becomes thicker, acquiring an inch or more in diameter. The scraped stems of this plant form the second ingredient in tonga.—*Gardeners' Chronicle*.

Zygadenus paniculatus, Watson.—Mr. E. Jones, of Salt Lake City,

states that the bulbs of this plant contain a glucoside to which their poisonous properties are attributed. Convulsions and speedy death follow the eating of the bulbs of this plant. No antidote is yet known for it.—*Amer. Naturalist*, 1881, p. 651.

Arachis hypogæa, Lin.—Formerly peanuts came to the United States almost exclusively from South America and Africa; of late years, however, they have been grown here so extensively that the importations have almost entirely ceased. The bulk of the crop in the United States comes from Virginia, North and South Carolina, Georgia and Tennessee, the best nuts being raised in the vicinity of Wilmington, N. C. For the three States of Virginia, North Carolina and Tennessee alone the crop last year was upward of 2,000,000 bushels. The use of peanuts in different kinds of confectionery and cake has largely increased the sale of the nuts, and they are also used for an oil, which is expressed in considerable quantities from the seeds, and which is said to be in no way inferior to olive oil.—*The Cultivator*.

Euphoria litchi, Desf. s. *E. punicea*, Lamarek. Nat. ord. Sapindaceæ. Stanislas Martin describes the fruit as being 10 centimeters (4 inches) in circumference and 12 cm. long; fleshy; the seed with a hard testa; the embryo exalbuminous, hard. The arillus is covered with rough and sharp projections, weighs 35 centigrams, is brittle, contains tannin and brown resin, burns with flame and leaves little ash. The pulp of each fruit weighs 2 to 3 grams and contains much sugar, pectin, mucilage, tartaric acid and an aromatic principle.¹—*Bull. gén. de Thérap.*, April, p. 325.

Mulberry bark has enjoyed some reputation as a tæniifuge since Dioscorides. Dr. Bérenger-Féraud has experimented with the fresh bark of the black and white mulberry, taken from vigorous trees in the neighborhood of Toulon, and did not observe any appreciable physiologic effect. The bark was given in the form of infusion, in doses varying from 16 to 300 grams.—*Ibid.*, March, p. 220.

Eupatorium Ayapana, Vent.—H. Paschkis describes these leaves as attaining a length of 9 and a breadth of 2 centimeters, lanceolate, gradually acuminate, and at the base narrowed into a short petiole, of the thickness of paper and appearing finely hairy under a magnifying glass. The lowest two lateral nerves spring at a very acute

¹The litchi fruit is used in China and India in febrile diseases for its refrigerant acidulous properties.—EDITOR.

angle from the principal nerve, and each anastomoses in the form of a noose near the margin. The upper surface has few, the lower surface numerous almost circular stomata, with one or two contiguous cells scarcely larger than the guard cells. The hairs are several-celled, either pointed or glandular, and contain a yellow granular substance becoming darker with potassa solution.—*Zeitschr. Oest. Apoth. Ver.; Phar. Jour. and Trans.*, June 4.

Liatris odoratissima, Willd.—The leaves attain a length of 25 and a breadth of 2.5 centimeters, and are naked on both sides, but covered with small pits and furrows. Upon the surface, but very plentifully upon the petiole, are found glistening scales of coumarin. The leaves are oval, almost oblanceolate, the upper end truncate, the margin delicately undulate, the base diminishing into a long-winged petiole, midrib thick, lateral nerves at very acute angles, anastomosing in the form of double nooses near the margin. The stomata are numerous on both sides, in the mesophyll are found roundish or oblong cavities filled with a greenish or golden yellow oil, enclosing smaller strongly refracting drops. Both surfaces contain many funnel-shaped depressions, in which glands are imbedded.—*Ibid.*

Preservation of Hops.—Naumann and Pohl have patented a process according to which hops are dampened with alcohol and then pressed into any suitable vessel, which is afterwards well closed. The pressed hops become uniformly permeated with the alcohol and retain their properties for a long time.—*Archiv d. Phar.*, 1881, March, p. 201.

Castor is secreted, according to Jos. Fuchs, by glands contained on the inner surface of the castor sacs, and in the fresh state is of an unctuous consistence, but never liquid. Canadian castor has a rather weak odor resembling that of old willow bark; the odor of Siberian and European castor is much stronger, and has been likened to that of birch oil or Russian leather. The difference in odor is regarded as the best character for distinguishing the two kinds. Their shape is similar, frequently pyriform; egg-shaped bags of Siberian or European castor are apt to contain a large amount of calcium carbonate. Adulterations with resinous and gum-resinous substances are best detected by breaking the bags in the middle, when membranes should be observed pervading the contents.—*Archiv d. Phar.*, 1881, March, 189–195.

Varieties of Amber.—O. Helm describes, under the name of *glessite*, a peculiar variety of amber, which is dark colored, translucent or opaque, of spec. grav. 1·015 to 1·027, contains 0·44 per cent. of sulphur and behaves to solvents like ordinary amber, but on dry distillation yields probably formic (not succinic) acid.

Amber from Sicily is found of different shades of red or red-yellow, frequently displaying different colors, surrounded by a thin darker stratum, and of spec. grav. 1·052 to 1·068. Hardness, fracture, electrical behavior and amount of sulphur (0·52 per cent.) are the same as in amber from the Baltic, but it yields only 0·4 per cent. of succinic acid and the vapors are less irritating.

Roumanian amber is scarcely to be distinguished from the Baltic amber; it is usually rather harder, contains 1·15 per cent. of sulphur, has a density of 1·06 to 1·10, and on heating yields water sulphuretted hydrogen and 5·2 per cent. of succinic acid.—*Archiv d. Phar.*, 1881, April, p. 307; *Danzig Naturf. Ges.*

Naphthol, a New Remedy for Cutaneous Diseases.—Chemists distinguish two isomeric compounds, α naphthol and β naphthol. The latter, which has been experimented with by Prof. Kaposi, is extensively used in dyeing, and is met with in commerce in large lumps, violet-brown, of a crystalline texture, friable, with a slight odor resembling that of carbolic acid, easily soluble in alcohol, liquid and solid fats, also in dilute alcohol. It has been used in the form of a 10 per cent. alcoholic solution and of an ointment containing 15 per cent. of naphthol. It colors the skin faintly brown and produces only slight desquamation. It is rapidly absorbed, the urine is on the following day turbid, but contains no albumen. The ointment does not color the clothes or bandages, the alcoholic solution gives them a rose-red color, which is easily removed by hot water and soap.

Further observations must decide in which diseases naphthol is best indicated; also whether it may not be possible and useful to give it internally and let it act by secretion through the skin.—*Phar. Centralh.*, p. 238; *Allg. Wien. Med. Ztg.*

Administration of Quinia.—Dr. J. C. Stockard recommends the following: The white of egg is well beaten, a portion of the resulting foam is placed upon a spoon and the powder enveloped by the albumen may then be readily taken.—*Bull. gén. de Thérap.*, 1881, June, p. 509.

ON THE PREPARATION AND COMPOSITION OF COLCHICIN, AND ITS RELATION TO COLCHICEIN AND SOME OTHER PRODUCTS OF DECOMPOSITION.

BY JOHANN HERTEL.

Abstracted from "Pharm. Zeitschrift für Russland," Nos. 14 to 18, pp. 245-320, 1881. BY FRED. B. POWER.

In his interesting essay, the author, before proceeding to describe the results of his own experiments, reviews the history of colchicin and the results of the investigations of Pelletier and Caventon, Geiger and Hesse, Oberlin, Hübschmann, Souberan, Ludwig and Pfeiffer, Hübler, Reithner, Schoonbrood, Eberbach, Walz, Maisch, Aschoff, Boemeister, Bley and others, and calls attention to the fact that commercial colchicin is not a pure product, but, as obtained by the evaporation of an alcoholic tincture, consists of a mixture of colchicin with fruit sugar and other impurities, and that even the article designated as "*colchicinum purum*" contains, as a rule, but from 10 to 20 per cent. of pure colchicin.

In connection with the method employed by different chemists for the isolation of colchicin, which from time to time have been variously modified, the author suggests the following method of preparation, as being the most readily executed, and affording the largest yield.

The entire seeds are digested in a displacement apparatus with fresh portions of 85 per cent. alcohol until the outflowing liquid appears simply of a light yellow color, for which purpose the renewal of the alcohol four times is sufficient, and finally, in order to extract the last portions of the colchicin, boiling alcohol is employed. The united liquids, which possess a slight acid reaction, are treated with calcined magnesia, the whole well shaken, filtered after standing for some hours, and the alcohol finally distilled off by means of a steam-bath, *in vacuo*, until the residue has the consistence of a liquid extract; if the distillation takes place under ordinary atmospheric pressure, more time is required, and by too long an exposure to heat considerable diminution in the yield is experienced. The residue in the retort is mixed with about ten times its amount of water, the oily matter, which separates upon standing on the surface of the liquid, removed, the liquid filtered, and repeatedly shaken with chloroform until the latter remains nearly colorless; if the colchicin is thus completely removed, the liquid possesses, after the dissipation of the dis-

solved chloroform by warming, a sweet honey-like taste. The chloroform is then distilled off until the residue assumes the consistence of syrup, which is spread upon glass plates and warmed for an hour at a temperature of from 80 to 100°C. until the last traces of chloroform have completely evaporated.

As thus obtained, colchicin forms an amorphous, brown, brittle mass, which may be purified by again dissolving it in about twenty times its weight of water, whereby the coloring matter, which is insoluble in water, remains behind. The solution is then filtered and subsequently evaporated in a shallow capsule. In this manner the yield of pure colchicin amounted to from 0.38 to 0.41 per cent., the yield being larger when the entire seeds instead of the previously ground seeds are employed, as from the latter a considerable amount of fixed oil, fruit sugar and mucilaginous substances are extracted, by the removal of which from the colchicin the latter becomes partially decomposed.

In regard to the chemical properties of colchicin the statements of previous investigators being largely at variance, and in many respects contradictory, the author has endeavored to ascertain its true nature, and first directs his attention to the substance to which the color of colchicin is due, and which is named *colchicoresin*. This substance, which is obtained as a deposit, of a coffee-brown color, when the colchicin obtained from the chloroformic solution, by the above described method of the author, is dissolved in water, is also formed when colchicin is preserved for a long time with exposure to the air, or when the colchicin, in contact with a small amount of water, is exposed to a high temperature; colchicin which has become brown by heating consists for the most part of colchicoresin.

The colchicoresin, after being freed as completely as possible of colchicin, by washing with distilled water, was dissolved in alcohol, the solution filtered, and evaporated in a shallow capsule upon the water-bath. After drying, it forms an amorphous, dark brown, resinous-like and brittle, readily pulverizable mass. It is very sparingly soluble in cold water, but imparts to the latter, after long standing, a yellow color; it is more readily soluble in boiling water, the solution becoming turbid upon cooling; in chloroform and alcohol it dissolves readily, with a brown color, but is insoluble in ether. It dissolves also in ammonia water and in solution of potassa, the solutions possessing, even in a dilute condition, a brown color.

Of the reactions of colchicin many are not afforded by colchicoresin without possessing other characteristic reactions. The color reaction with potassium nitrate and sulphuric acid, or with solution of potassa, is produced the same as with colchicin; with tannic acid or with iodinated potassium iodide a turbidity is only produced after some time, while with phosphomolybdic acid a precipitate is immediately produced. Ferric chloride produces in very dilute solutions a brownish-green coloration. At 100°C. it becomes soft, like wax, and melts at a higher temperature without decomposition.

By treatment with mineral acids two other substances were obtained, which, together with colchicein, appear by the decomposition of colchicin with mineral acids, viz., a resinous substance, insoluble in water (beta-colchicoresin), and a substance readily soluble in water; but no colchicein could be obtained therefrom. Colchicoresin is without action upon litmus, and indifferent in its behavior towards polarized light. When dried at 100°C. until of constant weight it afforded 0.73 per cent. of ash, and gave upon analysis numbers which correspond to the empirical formula $C_{51}H_{60}N_2O_{15}$.

Colchicoresin is not contained in the unripe seed or tubers, but is present to a considerable extent in the dead leaves surrounding the tuber, and also in the dried seed and tubers to an amount equal to that of the colchicin, so that it may be accepted that the color of the ripe seed is due to the colchicoresin.

Chemical Properties of Colchicin.—As prepared by the author it is amorphous, and, when obtained from the dried seed, and in its purest possible form, of a sulphur-yellow color, while from fresh summer tubers it is obtained colorless and transparent. It could not be obtained by any method in a crystalline form. It possesses a very slight alkaline reaction, which only appears upon litmus paper when the latter has become nearly dry, so that this may possibly be dependent upon the formation of ammonia, while the basic properties, as described by Geiger and Hesse, Schoonbrood and Maisch, could not be observed. Colchicin is much rather a very indifferent body, which is capable of combining with proportionately very few bodies, and, as it would appear, combines with no acid to form a chemical compound. It does not combine with ethyl iodide, and the only known compound worthy of consideration is that with tannic acid, which also, according to Hübner's analyses, does not possess a constant composition. It deserves, therefore, as Hübner has previously observed, on account of

its indifference, and as possessing but little in common with the organic bases, to be removed from the latter group. It melts at 145°C., assuming a brown color, and, upon cooling, becomes glass-like and brittle; it is without action upon polarized light.

A portion of colchicin which had been repeatedly purified, and dried at 105°C., afforded upon analysis numbers which correspond to the empirical formula $C_{17}H_{23}NO_6$.

Colchicein.—This was obtained by the author by heating 1 part of colchicin, dissolved in about 30 parts of water, with 2 parts of 25 per cent. hydrochloric acid, upon the steam-bath. After purification, by means of boiling water, it was obtained perfectly white and odorless. It dissolves readily in alcohol, chloroform and solution of potassa, with a yellow color; it is also soluble in ammonia water, separating in a crystalline form by the evaporation of its solution. From its solution in absolute alcohol or chloroform it is deposited upon evaporation as a yellow varnish-like coating, which, however, when dissolved in diluted alcohol, again affords upon evaporation crystals of unchanged colchicein. It melts at 150°C., assuming a yellow color, and becoming brittle upon cooling; when heated to 200°C. it acquires a brown color, and can no longer be obtained in a crystalline form. Colchicein crystallizes in two different forms of the rhombic system: from its alcoholic solution in rhombic tables, and from the original hydrochloric acid liquid in rhombic prisms; it deviates the plane of polarization to the left. When heated for some time with a little water at the temperature of the water-bath, it is converted into a yellowish-brown mass, which is uncrystallizable and has great similarity with colchicin. By the evaporation of the mother-liquid of colchicein colchicin is likewise obtained. The behavior of colchicein toward reagents is in general the same as that of colchicin, but it is not precipitated by tannic acid. When, however, a saturated aqueous solution of colchicein is allowed to stand for several days, it then affords a precipitate with tannic acid, which would indicate that by prolonged contact with water, or by warming therewith, colchicein is inversely converted into colchicin. Acid solutions of colchicein show the same behavior towards reagents as neutral solutions; its most characteristic reaction is with ferric chloride, which, even in very dilute solutions, produces a beautiful green coloration. When dried at 110°C. it lost, as an average, 10.998 per cent. of water, and

afforded upon analysis numbers which correspond to the empirical formula $C_{17}H_{21}NO_5 + 2H_2O$.

According to Hübler, colchicein has the same composition as colchicin; it is possible, however, that the colchicein analyzed by Hübler was not perfectly pure, and still contained some adhering beta-colchicoresin, whereby too large an amount of carbon was found.

An alcoholic solution of colchicein feebly reddens litmus paper, and thus bears the character of an acid. Hübler had indeed formed therewith compounds with barium and calcium, the correctness of which is confirmed by the experiments of the author. The compounds of colchicein with bases, with the exception of the potassium and sodium compounds, are insoluble in water, but readily soluble in alcohol and chloroform; they are amorphous, and of a yellowish-white color, the copper compound of a beautiful green color. The author does not doubt but that it will be possible to form also compounds of colchicein with the other metallic oxides.

Beta-colchicoresin, the resinous product of decomposition previously referred to, forms a blackish-brown amorphous mass. It is absolutely insoluble in water and in ether, very sparingly soluble in aqueous alcohol, but readily in 95 per cent. alcohol, the latter solution acquiring a milk-like turbidity upon the addition of water. It is readily soluble in chloroform, carbon bisulphide, solution of potassa and ammonia water, forming dark brown solutions. With the ordinary precipitating agents it only affords a precipitate with phosphomolybdic acid, which is explained by the fact that it can only be tested with reagents in its strong alcoholic solution. The color reaction with potassium nitrate and sulphuric acid is produced with the same characteristic sensitiveness as with colchicin; with ferric chloride it yields a brownish-green coloration. It becomes soft like wax between the fingers, and melts at $90^{\circ}C$. Beta-colchicoresin is best obtained by heating colchicoresin with hydrochloric acid. For the purpose of analysis a product was employed which had been previously carefully boiled with water, then dissolved in alcohol, the solution filtered, allowed to evaporate upon watch-glasses, and finally dried at $85^{\circ}C$. Figures were thus obtained from which was calculated the empirical formula $C_{34}H_{30}NO_{10}$.

Residue from the Mother-liquid.—The residue left by the evaporation of the mother-liquid as obtained in the preparation of the colchicein, after the complete removal of the latter by means of chloroform,

was also examined by the author. It forms a brownish-yellow, readily pulverizable mass, readily soluble in water; it is permanent in the air, and is not decomposed at a temperature of 200°C. It feebly reddens litmus, and, like all the other decomposition products of colchicin, is not precipitated by tannic acid.

The reaction with potassium nitrate and sulphuric acid, or with solution of potassa, appears with this substance still finer than with colchicoresin and beta-colchicoresin, and the reaction with ferric chloride is also of a finer color. It is remarkable that, with the exception of tannic acid, it is much more sensitive toward all the precipitants of colchicin than the latter, and is also affected by the following reagents, which, in neutral solutions of colchicin, produce no reaction, and only afford precipitates in strongly acidulated solutions. Picric acid gives a yellow, and potassio-cadmic and potassio-mercuric iodides a yellowish-white precipitate. Upon ignition, the substance left 2.502 per cent. of ash. After drying at 115°C., the substance afforded upon analysis numbers from which is calculated the empirical formula $C_{51}H_{76}N_2O_{32}$. This analysis, however, has naturally but little value as long as it cannot be proven that the substance is a simple and definite body.

A number of physiological experiments, instituted and detailed by the author for the purpose of deciding the question whether the decomposition products of colchicin still retain the poisonous properties of the latter, or whether they differ therefrom in their action, have resulted in demonstrating that colchicein, colchicoresin and beta-colchicoresin retain the poisonous properties of colchicin, while the residue from the mother-liquid, above referred to, shows in doses of 0.6 gram no toxic action.

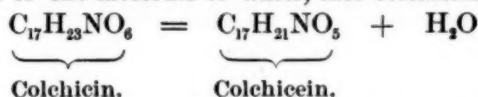
Relations between Colchicin, Colchicein, etc.—In order to determine the proportions in which beta-colchicoresin and colchicein are formed from colchicin by heating with acids, several quantitative experiments were made, which have led to the result that the formation of colchicein and beta-colchicoresin does not take place in constant proportions. As a rule it was observed that the less colored the colchicin, and therefore the less colchicoresin it contains, the yield of colchicein is larger, and that of beta-colchicoresin smaller. This circumstance, as well as that colchicoresin upon heating with acids furnishes only beta-colchicoresin, induced the author to experiment upon the decomposition of the purest possible colchicin. For this purpose colchicin was dissolved in

a little water, the solution filtered, and evaporated upon the steam-bath *in vacuo*.

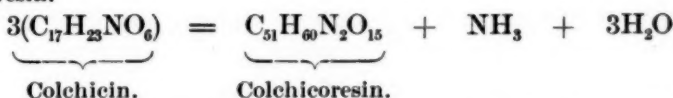
After repeating this operation three times, a product was obtained which was but slightly colored, and, after incomplete drying, was decomposed by heating 0.736 gram, dissolved in 15 grams of distilled water, with 15 drops of 25 per cent. hydrochloric acid, at the temperature of the steam-bath, in a sealed tube. The amount of beta-colchicoresin thereby formed was scarcely weighable, while the yield of colchicein was 0.695 gram, or 94.929 per cent. of the applied colchicin, and the residue from the mother-liquid amounted to 0.105 gram, or 14.268 per cent.

In regard to the relation of the different products of decomposition to colchicin, the following conclusions may be drawn from the results of the above experiments:

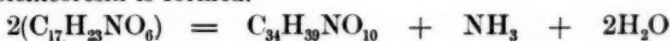
Colchicin, by heating with mineral acids, is converted by the elimination of a molecule of water into colchicein, which, in the act of separation, combines with 2 molecules of water of crystallization. By heating with water, colchicein is again inversely converted, through the absorption of one molecule of water, into colchicin.



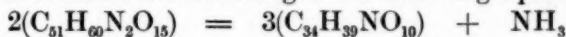
Three molecules of colchicin lose, by exposure to the air, 1 molecule of ammonia and 3 molecules of water, with the formation of colchicoresin.



By the further elimination of ammonia, so that two molecules of colchicin lose one molecule of ammonia and two molecules of water, beta-colchicoresin is formed.



It is, however, considered most probable that beta-colchicoresin is formed from colchicoresin according to the following equation:



In regard to the residue from the mother-liquid, the author states that this substance can be brought in no direct connection with colchicin, but it is not improbable to accept that it is formed from portions of colchicein and beta-colchicoresin remaining dissolved in the mother-

liquid, through further decomposition by their evaporation with the hydrochloric acid. In concluding, attention is again called to the acid-like properties of colchicein, although its compounds with bases will remain a subject for further study and investigation.

In a note to his essay the author also reviews the recent investigations of Dannenberg, Molz and Morris (see this journal, 1881, p. 6), and, in view of the fact that colchicoresin and beta-colchicoresin are not inferior in activity to colchicin, into which the latter has great tendency to become converted, and that the former being insoluble in water and cold diluted alcohol, it is considered that the best and simplest pharmaceutical colchicum preparation would be a tincture, obtained by digestion of the seeds with at least 90 per cent. alcohol, and that the acetum, vinum and oxymel colchici are preparations which should be entirely discarded.

A preparation more to be recommended for therapeutical purposes than a tincture prepared with strong alcohol is considered by the author to be a solution of pure colchicin in alcohol, and, in the same connection, attention is called to the fact that in forensic examinations it is useful to extract the object under examination with the strongest alcohol, after having been previously treated according to the ordinary method; in this manner the poison would then, even after having become completely converted into beta-colchicoresin, be readily detected by the respective reactions.

CONTRIBUTION TO THE KNOWLEDGE OF JAPANESE BELLADONNA.

BY DR. A. LANGGAARD. Tokio (Japan).

Abstracted from "Archiv der Pharmacie," Bd. xv, pp. 135 to 138, Feb., 1881, by FREDERICK B. POWAR.

The subject of Japanese belladonna has been previously referred to (see this journal, 1880, p. 356 and p. 456). According to Holmes it is not derived from an *Atropa*, but from the related species *Scopolia japonica*. Flückiger presumed it to contain *atropia*, but according to an examination made of it in Japan, it contains *solania*. The author refers to his previous communication, "On the active constituents of the root of *Scopolia japonica*," *loc. cit.*, p. 456, in which mention is made of two alkaloids extracted therefrom. The one which is present in but small amount in the root is, in accordance with the Japanese name of the plant, "*roto*," called *rotoina*, and is abstracted from the

acid solution by chloroform. It crystallizes, furnishes crystallizable salts, and its solution produces dilatation of the pupil when dropped into the eye of a rabbit. The second alkaloid, which occurs in the root in larger amount, is extracted from the alkaline solution by chloroform, and was only obtained in an amorphous condition. It is sparingly soluble in water, but readily soluble in acidulated water, also in chloroform and alcohol. For this alkaloid the name *scopoleina* has been proposed, and, as has been previously stated, in its action upon the animal organism it appears to resemble atropia, although the relation which it bears to this latter alkaloid has not yet been established. In consequence of a deficiency of material, an analysis could not be made of it, but the following data are believed to suffice to indicate the position of the body from a pharmacodynamical point of view.

Sodium hydrate, sodium carbonate and ammonia precipitate the alkaloid from its solutions in slightly acidulated water as a white, curdy precipitate, which dissolves in an excess of the precipitant. Iodine in potassium iodide produces a brown-red precipitate; mercurio-potassic iodide, cadmium iodide and sodium phosphomolybdate produce white precipitates, which dissolve without coloration in an excess of ammonia. Tannic acid precipitates it from its acid, neutral and feebly alkaline solutions. Upon the addition of an excess of acid the precipitate is increased in extent, and is dissolved by ammonia. Gold chloride produces a yellow precipitate; platinic chloride does not precipitate it from dilute solutions, but from concentrated ones a whitish yellow precipitate is obtained. Mercuric chloride produces no precipitate. Concentrated nitric acid forms a colorless solution, but upon warming the solution becomes bright yellow. With concentrated sulphuric acid it forms a colorless solution, but upon warming it becomes brown with the development of the odor of flowers. A similar odor is also developed on warming with sulphuric acid and potassium bichromate. When boiled with alcoholic potassa, the alkaloid is split into a new base and an acid, the latter being obtained from its ethereal solution on evaporation as an oily liquid, which is almost insoluble in cold water. In hot water it is somewhat more soluble, and crystallizes from this solution in long, colorless needles. It volatilizes with the vapors of water.

Characteristic for the action of the alkaloid is the dilatation of the pupil, which is produced as well by internal as by direct application, and its action upon the heart. The heart of a frog brought to a con-

dition of rest by muscarin is again made to beat by the action of scopoleina, and with warm blooded animals the heart is withdrawn from the action of the pneumogastric nerve, so that after poisoning has taken place irritation of the latter does not produce inactivity of the heart.

This alkaloid is accordingly closely related to atropia, and is to be placed by the side of atropia, hyoseyama, duturia and duboisina. Whether the substance is a new alkaloid, or whether it is identical with one of the above named alkaloids, the further examination must decide. At all events, the supposition of Flückiger finds its confirmation, that an alkaloid belonging to the atropia group is present in the root.

In regard to the occurrence of solania in the root, the author has also directed his attention to this statement, and finds that after the separation of the above mentioned alkaloids a third basic body may be isolated from the alkaline residue by means of hot amylic alcohol, which may possibly prove to be solania.

PHARMACEUTICAL NOTES.

BY ROBERT F. FAIRTHORNE, PH.G.

Cod liver oil jelly can easily be prepared in the following manner:

R	Cod liver oil,	5 fluidounces.
	Best isinglass,	2 drachms.
	Sugar (white) powdered,	1½ ounce.
	Oil of bitter almonds,	4 drops.
	“ Allspice,	4 “
	“ Cinnamon (Ceylon),	2 “
	Water,	1 fluidounce.

Having placed the cod liver oil, isinglass and water in a suitable vessel over a water-bath, apply sufficient heat to melt the isinglass, then add the sugar, the essential oils having been mixed with it by trituration, and remove from the fire, stirring the mixture as it cools until it thickens. When it is cold a firm jelly will result, which will keep without spoiling for any length of time if put up in corked bottles. The consistence of this jelly is such that it may be taken in water, milk or wine without tasting the oil.

An Effervescing Powder of Rochelle and Epsom Salts.—A considerable proportion of the magnesium sulphate can be added to the potassium and sodium tartrates and taken as an effervescing draught without the disagreeable bitterness of the former being perceptible. Pre-

parations of this character having come largely into use, it may possibly interest some of the readers of this journal if a formula is given by which such can be economically made.

The chief difficulty generally met with by those pharmacists who attempt to make such articles is owing to the fact that sufficient care is not exercised in thoroughly drying each of the ingredients used, separately, before mixing them, so as to prevent any chemical combination from taking place when packed in bottles; when this occurs, instead of the mixture remaining in the form of a powder it becomes a solid mass that renders the compound unsalable. The articles used should be spread upon shallow trays and left in a drying closet for about two or three days, at a temperature between 90° and 120°F., then, when perfectly free from moisture, should be triturated separately in a mortar and passed through a sieve (No. 40) and all the ingredients thoroughly mixed. The compound should be put up in well-stoppered bottles, and as thus prepared will keep for any length of time. The effervescing mixture as made by the following formula will be found to bear a close resemblance to a very popular proprietary article both in taste and effect.

R Potassii et sodii tartrat., . . .	5 lb. 10 oz.
Sodii bicarbonatis,	2 lb. 14 oz.
Acidi tartarici,	2 lb. 8½ oz.
Magnesii sulphatis,	1 lb. 9 oz.

The quantities here named are in avoirdupois weight.

Palatable Laxative Lozenges can readily be prepared by the following method:

After having washed some dried prunes (a pound, for instance), place them in a saucepan over a dull fire or on a sand-bath, with just sufficient water to nearly cover them; when they have boiled long enough to become quite soft, and the greater part of the water has been evaporated, allow them to cool and rub them in a large mortar, so as to crush the fruit, but not the kernels. Transfer them to a coarse straining cloth and squeeze the pulp through it. This should be about the consistence of honey in the winter. If not, it can be made so by evaporating it over a water-bath. This makes the excipient to form the mass with the following ingredients out of which the lozenges can be made, namely, with the compound liquorice powder of the German Pharmacopœia, the formula of which has been published in this journal, 1872, p. 292, and 381; 1876, p. 138.

The compound liquorice powder is made into a mass of a pilular consistence with the prune paste, and divided into lozenges weighing about half a drachm each, which will be found pleasant and act as a laxative in doses of one or two.

A purgative lozenge can be made from the following, and will not be disagreeable, namely :

Pulverized Senna leaves,	4	ozs.
“ Sugar,	4	ozs.
“ Jalap,	$\frac{1}{2}$	oz.
“ Gum arabic,	6	drs.
Aromatic powder,	6	drs.

Prune paste, sufficient quantity to make a mass and divide into large troches.

Syrup of Chloral.—It is a difficult matter to cover the peculiar acrid taste of chloral, but I have found this difficulty overcome to a considerable extent in the formula here given, viz.:

R Chloral. hydr. cryst.,	3i	grs. xx
Aquæ menth. pip.,	f3iii	
Curacoa cordial,	f3iv	
Syrup acacia,	q. s. ut ft.	f3ii

PRACTICAL NOTES FROM FOREIGN JOURNALS.

BY THE EDITOR.

Troches of Borax are difficult to prepare by the usual method for preparing troches, because with gum arabic a mass scarcely plastic and difficult to divide is obtained, while tragacanth yields an extremely elastic mass impossible to divide. F. Vigier recommends the following process :

Take of Borax,	100	grams.
Powdered sugar,	900	
Carmin No. 40,	0.15	
Tragacanth in flakes,	2.50	
Distilled water,	60	
Tincture of benzoin (Siam),	10	

Prepare a mucilage from the tragacanth, and one-half each of the water and tincture. Mix the sugar with the carmine, and add one-half of this sugar in small quantities to the mucilage; then add the remainder of the water and tincture, and with this mixture incorporate the powdered borax and remainder of the sugar, previously thoroughly mixed. Divide the mass into troches, each weighing 1 gram, and containing 0.10 gram of borax.

These troches have been used with good success by M. Poinso, dentist, in various affections of the mouth, such as aphthæ, scorbut, etc.—*Rép. de Phar.*, Feb. p. 59.

Tænistuge Electuary for Children.—C. Slop von Cadenberg recommends the following: Pumpkin seeds deprived of their testa 30 grams are beaten with water 3 grams until a pulpy mass is obtained, which is mixed with honey 30 grams. It is to be taken in the morning in two doses, to be followed after several hours with 15 grams of castor oil.—*Phar. Centralhalle*, 1881, p. 284.

Cachous.—Dissolve extract of licorice root in warm water 100 parts; add powdered catechu 30 parts, and gum arabic 15 parts; evaporate in a warm bath to an extract, adding cascarilla bark, vegetable charcoal, orris root and mastic, of each 2 parts, and when nearly cold add peppermint oil 2 parts, tincture of ambergris and tincture of musk each 10 drops (parts=grams? Editor.) Cut the mass into pieces of suitable size and shape. These will of course be black or dark colored. It has recently been noticed that thymol has a powerful deodorizing effect on tobacco smoke.—*Canad. Phar. Jour.*, June, p. 365.

Cigar Flavors.—I. Fluid extract of valerian, f 3i; tincture of tonka (1:8), f 3viii; alcohol q. s. ad f 3xxxii.

II. Acid valerianic, f 3iii; butyric ether, ℥x; acetic ether, ℥xxxx; alcohol, f 3lxiv.

III. Tinct. valerian, f 3iv; butyric ether, f 3iv; tinct. vanilla, f 3ii; spir. nitrous ether, f 3i; alcohol, f 3v; water sufficient for f 3xvi.—*Ibid.*

A clear concentrated solution of carbolic acid is obtained by M. Perschne by adding to the acid an equal weight of glycerin.—*Phar. Zeitschr. f. Russl.*, 1881, p. 398.

Chlorophenols are less corrosive and poisonous than phenol, and the trichlorophenol has probably most advantage in this respect. The greater healing power of a mixture of carbolic acid and chlorinated lime seems to be due to the formation of chlorophenols, which, however, cannot, without danger, be prepared in this manner on the large scale. By treating phenol with chlorine a red crystalline mass was obtained by C. O. Cech, from which white crystals were obtained by pressure between filtering paper, consisting of a mixture of monodi- and trichlorophenol, which may be purified by dissolving in alcohol and precipitating by water. These chlorophenols are applied by impregnating

bandages with an alcoholic solution.—*Jour. prak. Chem.* (2), 22, 345–347.

Administration of Castor Oil—M. Perschne recommends an emulsion prepared from 15 grams of castor oil with one yolk and 45 grams water, which, after the addition of about 10 grams of brandy or sherry wine, is taken in lemonade.—*Phar. Zeitsch. f. Russl.*, 1881, p. 398.

Disguising the Odor of Iodoform.—In discussing the value of the different substances recommended for this purpose Hager states that the activity of iodoform depends upon the gradual liberation of iodine, and that the addition of all substances should be avoided which enter into combination with iodine. Hence all drugs containing tannin should be discarded; even balsam of Peru resorbs much iodine, and should never be used in larger proportion than 1 part to 10 parts of iodoform. Volatile oils of anise, fennel, peppermint, etc., appear to be the most useful, only 1 part of these to 20 parts of iodoform being necessary.—*Phar. Centralhalle*, 1881, No. 12.

Tonka bean, the seed of *Dipterix odorata*, has been recommended for the same purpose by V. Mosetig. The seed which contains coumarin, entire or split longitudinally, is placed into a bottle containing from 150 to 200 grams of iodoform; the latter loses its peculiar odor in a short time, which is replaced by a faint bitter almond odor. Or the iodoform may be rubbed up with a small quantity of the alcoholic or ethereal extract of tonka.—*Allg. Wien. Zeit.*, June 14.

Tannate of chinoidin is prepared by Reiher and Klamann by diluting 100 grams of tincture of chinoidin (chinoidin 2 parts, alcohol 17 parts, hydrochloric acid 1 part) with 500 grams of water and adding a solution of 50 grams of tannin in 1,000 grams water, and subsequently a solution of ammonium acetate. After 10 hours the precipitate is collected, washed and dried at a temperature not exceeding 30°C. (86°F.) It is of a yellowish-brown color, tasteless, and yields with cold water, on the addition of a little hydrochloric acid, a dark yellow solution. The dose to small children is 0.5 to 1.0 gram (gr. viii to xv).—*Phar. Centralhalle*, 1881, p. 273.

Fowler's Solution.—The algaceous growth frequently observed in this solution is entirely prevented, according to Perschne, by replacing one-fourth of the water with glycerin.—*Phar. Zeitsch. f. Russland*, 1881, p. 397.

Emulsion of Oleoresin of Male Fern.—Mayet gives the following formula:

Water,	24 drops.
Oleoresin of male fern,	4.0 grams.
Powdered gum arabic,	1.2 "
Add water sufficient.	

M. Limousin effects the emulsion simply by the use of yolk of egg.
—*Bull. et Mém., Soc. de Thérap.*, March 30, p. 57.

Solubility of Morphia in Water.—P. Chastaing determined that 1 liter of water at 3°C. dissolves 0.03 gram, at 22°C. 0.22 gram, and at 42°C. 0.42 gram of morphia. Above 45°C. the solubility increases rapidly, and at the boiling point 1 liter of water dissolves 2.17 grams of morphia.—*Rép. de Phar.*, May, p. 219-222.

Solution of Morphia.—According to Prof. Hamberg of Stockholm morphia sulphate is less prone to decomposition and to the formation of mycelia than the hydrochlorate and other salts; the sulphate is therefore best adapted for medicinal morphia solution. It should be dissolved in boiling distilled water which is free from ammonia, phosphoric, nitric and nitrous acid; the solution should be filtered through paper not previously moistened, and is best preserved in small well filled vials closed with a glass stopper.—*Phar. Zeitung*, No. 49.

Powdered ergot deprived of the fixed oil, and kept in well dried 2-ounce vials, has been kept by G. Zschiesing for two years without losing its efficacy, and by E. Bombelon for nine years with the same result. The oil is removed by ether.—*Ibid.*, No. 49, 51.

Reaction of the Ptomaïns.—According to Brouardel and Boutmy, the sulphates of the ptomaïns reduce instantly ferridecyanide of potassium to ferrocyanide, and the mixture then precipitates Prussian blue on the addition of ferric chloride. Of the vegetable alkaloids only morphia effects the same reduction at once; veratria reduces only traces of the ferridecyanide.—*Berichte*, xiv., 1293; *Compt. rend.*, xcii., 1056.

Reactions of Peptones.—According to C. H. Tanret peptones obtained with pancreation and with pepsin yield, with the ordinary reagents for alkaloids, precipitates, which, however, are dissolved by an excess of peptone. Coagulated albumen dissolved in caustic soda and the solution neutralized, yields a filtrate, which, like the peptones, yields a violet-red color with Fehling's solution. This modified albumen, like peptone, is not precipitated by lime, is soluble in ordinary alcohol, and since other albuminoids are likely to possess the same property, it is obvious that precipitates obtained with potassio-mercuric iodide, bromine water, tannin, etc., are not conclusive proofs of the presence of an alkaloid.

Peptone treated with potassium carbonate, or better with potassa, yields to ether a small quantity of a volatile alkaloid, and after putrefaction a notable quantity of a solid alkaloid is obtained from peptone by treatment with caustic alkali, but not with bicarbonates.

According to Brouardel and Boutmy the ptomaines reduce cyano-ferrid at once; the alkaloids obtained from peptone effect the reduction slowly, and a similar effect is produced by crystallized ergotinina and aconitia, and by amorphous and crystalline digitalin. But an instantaneous reduction is effected as by morphia, also by eserina, liquid hyoscyamina, and amorphous aconitia and ergotinina.—*Bull. gén. de Thér.*, 1881, May, p. 463–465.

Bottling Wax from a Bye-product.—The balsam of Tolu, left in the preparation of syrupus tolutanus Br. P., made by boiling Tolu balsam in water, according to J. F. Brown, may be utilized for bottling wax, by stirring levigated bole into it while melted. A mixture of the residual balsam, amber resin each 4 parts, Venice turpentine, vermillion each 1 part, melted together and well stirred forms sealing wax of very fair quality.—*Phar. Jour. and Trans.*, June 4, p. 1003.

Culinary Essences.—G. S. Illingworth gives the following composition of satisfactory kitchen essences:

Name.	Made From.	Parts.	Parts.	
Almond or Ratafia,	Oil,	1	to 10	alcohol.
Cayenne,	Powdered pods, fresh,	1	to 8	"
Celery,	Seeds, bruised,	1	to 3	"
Cinnamon,	Oil,	1	to 5	"
Cloves,	Oil,	1	to 3	"
Lemon,	{ Lemon peel, $\frac{5}{8}$ xx, Essential oil, $\frac{5}{8}$ xvi,	$\frac{1}{2}$	gall.	"
Mace,	Powder,	1	to 4	"
Nutmeg,	Nut, bruised,	1	to 4	"
Orange,	Peel,	1	to 2	"
Pimento,	Oil,	1	to 4	"
Rose,	Essence,	1	to 40	"
Sandal wood,	Essence,	1	to 12	" Absolute.
Vanilla,	Pods,	1	to 20	"
Verbena,	Essence,	1½	to 20	"

—*Chemists' Journal*, July 22, p. 56.

COMPARATIVE EXPERIMENTS ON THE BEHAVIOR OF THYMOL AND CARBOLIC ACID TOWARDS CERTAIN REAGENTS.

BY EDWARD HIRSCHSOHN, MAG. PHARM., Dorpat.

In the preparation of bandages impregnated with thymol and its solutions it often becomes a question how definitely to determine the presence of thymol in aqueous solutions.

In the literature of the subject accessible to me I could find no information, and consequently I instituted a series of experiments, the results of which I purpose giving in the following paper.

In these experiments I used a solution of thymol prepared in the following manner: One part of commercial thymol was put into a stoppered bottle with 1,000 parts of water at 60° to 70°C., shaken until completely dissolved, and cooled. The solution of carbolic acid, also in water, was of the same strength.

1. MILLON'S REAGENT.¹

In this experiment 2 drops of the reagent were added to 5 cc. of the solutions, and the whole heated to the boiling point.

a. Experiments with Thymol: 1 to 1,000: turbid by boiling, becoming clear and reddish-violet in color; on cooling again turbid.

1 to 2,000: the same as the previous experiment, but color paler.

1 to 4,000: same as the two former, but the mixture remained clear.

1 to 8,000: pale rose and clear.

1 to 16,000: very pale red and clear.

1 to 32,000: no perceptible reaction.

b. Experiments with Carbolic Acid: In all these experiments the mixture, on boiling, showed a more or less intense red color, depending on the degree of concentration, the same as had been previously observed by Almén.² From these experiments it results that Millon's reagent gives with thymol only a pale coloration, and in a dilute solution of 1 to 16,000 the reaction is very weak, whilst carbolic acid, according to Almén, can be recognized even in a dilute solution of 1 to 2,000,000.

2. HYPOCHLORITE OF LIME AND AMMONIA.

To 5 cc. of solution 4 drops of ammonia were added, and then 1 drop of a chloride of lime solution (1 to 3), and the whole warmed.

¹ Neubauer und Vogel, "Analyse des Harns," Weisbaden, 1876, p. 70.

² "Archiv der Pharmacie," 3d series, vol. x, p. 53.

a. Experiments with Thymol: 1 to 1,000: turbid and opaque, flocks formed on boiling; after some time (half an hour) the mixture became gradually of a greenish color.

1 to 2,000: same as last, no green color.

1 to 4,000: slightly opaque, and on boiling turbid, but showing no color.

1 to 8,000: }

1 to 16,000: } clear on mixing, but turbid on boiling.

1 to 32,000: }

b. Experiments with Carbolic Acid: Here I could not with a greater dilution than 1 to 4,000 perceive a color which was greenish. According to Almén a fine reaction is obtained with a dilution of 1 to 5,000.

This series of experiments shows that thymol with chloride of lime and ammonia shows no color, like that of carbolic acid, but that thymol solutions are precipitated by chloride of lime. In continuation of the subject I have made some experiments with chlorinated soda, chlorine water, etc.

3. CHLORINATED SODA.

The solution was obtained by mixing 1 part of chloride of lime, 20 parts of water and 1 part of carbonate of soda. Five drops of this solution were added to 5 cc. of the solution under examination.

a. Experiments with Thymol: 1 to 1,000: turbid and opaque; on the addition of more of the solution of chlorinated soda, up to an equal volume, no change was perceived.

1 to 2,000: as the former experiment.

1 to 4,000 and 1 to 8,000: turbid, opalescent, but no change on the addition of more of the reagent.

1 to 16,000 and 1 to 32,000: opalescent, and the mixture gradually becomes clear on the addition of an equal volume of the reagent.

b. Experiments with Carbolic Acid: On the addition of chlorinated soda there arises a turbidity which, on shaking, immediately disappears, and the mixture becomes more or less yellow, depending on the degree of concentration. On the gradual addition of more chlorinated soda there occurs a point when the turbidity not only does not disappear, but even increases with each further addition, till at last a point is reached when it disappears.

The above quoted experiments show that chlorinated soda can be used to distinguish thymol from carbolic acid; but an excess of the reagent must be avoided, as in this case carbolic acid causes a precipi-

tate, which with a greater addition of chlorinated soda is dissolved, but at the same time the thymol precipitate dissolves.

4. CHLORINE WATER.

The chlorine water employed was the official preparation, and in the same proportion and quantity as in the third series of experiments.

a. Experiments with Thymol: The results obtained were nearly the same as those in the previous experiments (third series), only that here also an equal volume of chlorine water produced no apparent change. When solution of ammonia is added to the turbid mixture there occurs, either immediately or after a short time, according to the quantity of ammonia added, a clear mixture, and with dilutions of 1 to 1,000, bluish green; 1 to 2,000, greenish, and with the remainder, according to the dilution, a more or less greenish color.

b. Experiments with Carbolic Acid: The same appearances occur here as in those with chlorinated soda.

Chlorine water can be used in the same manner as chlorinated soda to distinguish thymol from carbolic acid, but an excess of the reagent must be avoided. I experimented to determine whether thymol could be detected in the presence of carbolic acid with this result, that if to 5 cc. of a solution of 1 to 1,000 of carbolic acid with 1 to 8,000 of thymol (equal parts) 5 drops of chlorine water be added considerable opalescence occurs; indeed, with a mixture which contained 1 to 10,000 of thymol, chlorine water furnished a distinct reaction.

5. BROMINE WATER.

This reagent shows towards thymol the same behavior as towards carbolic acid, but the sensitiveness is greater, as in a solution of 1 to 60,000 a turbidity occurs, whilst with carbolic acid, according to Almén, such a result was not obtained until after twenty-four hours.

6. CHLORIDE OF GOLD.

Read in the dilution in which it is usually employed as a reagent, and 1 drop was added to 5 cc. of thymol or carbolic acid solution.

a. Experiments with Thymol: 1 to 1,000: the mixture in about one second became turbid and greenish-black.

1 to 2,000: the same appearance in two seconds.

1 to 4,000: after about ten seconds, only the color was somewhat brighter.

1 to 8,000: }
1 to 16,000: } The action occurred later or earlier, depending on
1 to 32,000: } the dilution.

A dilution of 1 to 50,000: in fifteen minutes, and with longer time there occurred in all solutions a black precipitate.

b. Experiments with Carbolic Acid: There was here at the commencement no perceptible change, and only a slight reaction at the end of half an hour, whilst in two hours it was not so intense and striking as with thymol.

The property of thymol immediately to reduce gold in aqueous solutions can be used as a means of recognizing thymol in the presence of carbolic acid, as the latter only reduces chloride of gold after a long time. In a solution of 1 to 20 reduction does not take place in three minutes. Mixtures of equal parts 1 to 1,000 of carbolic acid with 1 to 2,000 of thymol gave reactions, also 1 to 1,000 carbolic acid with 1 to 5,000 of thymol gave a useful reaction; while 1 to 1,000 carbolic acid with 1 to 10,000 thymol gave no decided reaction.

7. CHLORIDE OF PLATINUM.

This reagent was employed in the same proportion as the chloride of gold, only after the addition of chloride of platinum the mixture was heated to boiling, as while cold no reaction occurred.

a. Experiments with Thymol: 1 to 1,000 and 1 to 2,000: cloudy and opaque.

1 to 4,000 and 1 8,000: cloudy and transparent.

1 to 16,000 and 1 to 32,000: became opalescent, and a faint opalescence was visible in a dilution of 1 to 64,000.

b. Experiments with Carbolic Acid: All degrees of dilution remained clear after boiling and long standing, but in the proportion of 1 to 1,000 an opalescence was after some time visible.

The results obtained with chloride of platinum must be presumed to be better for the recognition of thymol than others previously named, and the reagent is also useful to detect thymol in the presence of carbolic acid, whilst concentrated carbolic acid, 1 in 20, for instance, gives no reaction. It is possible to recognize thymol in mixtures of 1 to 20,000.

8. NITRIC ACID.

Five drops of the officinal nitric acid were added to 5 c.c. of the solutions of thymol and carbolic acid respectively and boiled.

a. Experiments with Thymol: 1 to 1,000: golden-yellow, opaque.

1 to 2,000: lemon-yellow, opaque.

1 to 4,000: light yellow, transparent.

1 to 8,000: same, but paler yellow.

1 to 16,000: opalescent and yellow.

1 to 32,000: little opalescence and pale yellow.

b. Experiments with Carbolic Acid: In these experiments the solutions became by boiling clear, except with the solution of 1 to 1,000, which on cooling was slightly turbid and colored more or less yellow, according to the state of dilution. Nitric acid gives on warming very useful reactions to distinguish thymol from carbolic acid, unless the latter acid should not be in a concentrated solution, as the nitric acid causes a turbidity.—*Phar. Jour. Trans.*, July 9, 1881.

THE ESTIMATION OF THE PEPTONES.

BY T. DEFRESNE.

Since the appearance of peptones in therapeutics they have been the object of general attention. As inquiries are continually made as to the character of peptone preparations and as to the means of estimating their value, the following notes upon the subject may be found useful.

Several methods have been proposed for the estimation of the peptones, such as the density, precipitation by absolute alcohol and the determination of the ash and of the nitrogen. But it may be affirmed without hesitation that these processes have been put forward hastily, the limits of their exactitude having been neither studied nor determined by their authors.

Before proceeding to the estimation of any peptone it is of the utmost importance to examine it qualitatively. If this preliminary work be omitted, the subsequent estimations may be falsified by substances foreign to the peptone, which have been introduced with the object of facilitating its preservation or of constituting it a complete aliment, or with the less satisfactory design of making up a deficiency of peptone.

The value of density as an indication is but small, because of the gelatin, glucose and glycerin which may be met with in the solutions. It ought therefore to be rejected.

The process which consists in precipitating the peptone by absolute alcohol gives rise to two kinds of errors, according to the conditions under which it is employed. It allows on the one hand the estimation as peptone of the gelatin which is certainly precipitated, and on

the other it gives too low an indication, because peptone is dissolved by 99° alcohol.

Take, for example, a solution of peptone free from foreign matters and containing 25 per cent. of pure peptone. If this be precipitated by ten times its weight of absolute alcohol the weight of dried peptone obtained is 16.91 per cent., the error amounting to 32 per cent.

If simply the method of operating be changed, and the peptone be poured drop by drop into the alcohol, as recommended by Henninger, the weight of the peptone dried is 18.83 per cent., the error being diminished to 24.66 per cent.

If after having precipitated the peptone with alcohol, one-half its its weight of ether be added, the weight of dried peptone obtained is 20.83 per cent.; the error is lower, but still equals 16.68 per cent.

In order, therefore, that this process may be utilized it is necessary to add to the alcohol the half of its weight of ether, so as to determine a more complete precipitation. To the weight of the peptone thus found, relatively to 100 grams of solution, 5 grams should be added, as representing the quantity dissolved in the ether alcohol, and this will give the total weight.

The estimation of the ash is not worth notice, for it is usually falsified by the enormous proportion of chloride of sodium present.

Finally the estimation of the nitrogen may be affected by the abnormal presence of gelatin.

After this criticism upon the value of the different processes in use it may be shown that the precipitation by alcohol and the determination of the nitrogen become satisfactory processes for the estimation of a solution of peptone if it be submitted to a preliminary analysis. The following is the plan proposed:

The peptone is saturated hot with sulphate of magnesia; if it contains gelatin this rises in an elastic viscous mass and can be collected; in this case neither the density nor alcohol can be employed and it is necessary to have recourse to the determination of the nitrogen. The weight of the nitrogen due to the gelatin, subtracted from the weight of the total nitrogen, gives a number which, multiplied by the constant 6.05,¹ expresses the weight of dry and pure peptone.

The peptone which does not contain gelatin is diluted with twice its

¹ Fibrine peptone contains 16.66 per cent. of nitrogen (Henninger); albumen peptone contains 16.38 per cent. The mean being 16.52, 1 gram of nitrogen represents 6.05 of peptone.

volume of water, and to 4 cc. of this solution are added 2 cc. of a 3 per cent. solution of iodine. If the color becomes red-brown the peptone contains glucose; in this case alcohol would give an erroneous result, and it is necessary to have recourse to the determination of the nitrogen, the result multiplied by 6.05 giving the weight of dried peptone.

If the solution of peptone does not show gelatin or glucose, alcohol may be employed with some advantage in respect to celerity, provided that the following conditions be exactly followed: Take 10 grams of pepsin, pour into it with agitation 100 grams of absolute alcohol, and then add 50 grams of ether. Allow it to deposit for three hours, decant carefully and dry the precipitate at 100°C. on tared paper. Calculate out the weight found to 100 grams of solution and add 5, and this will represent the quantity of dry and pure peptone contained in a given weight of the solution.

The peptone may further contain alcohol and glycerin, but these cannot become a source of error in the precipitation of ether-alcohol. If it be desired to determine and separate the glycerin, the peptonic solution is evaporated at 90°C. in a flat capsule until the weight remains constant; the residue is then treated with 4 parts of alcohol and 1 part of ether immediately added; the ether-alcohol is filtered off, and by careful evaporation leaves the glycerin nearly pure. The capsule is returned to the stove and afterwards weighed; the difference in weight represents the quantity of glycerin removed by the alcohol.—*Répertoire de Pharmacie*, vol. ix, 262; *Phar. Jour. and Trans.*, July 2, 1881, pp. 8, 9.

Preservation of the Journal.—

To the Editor:

I lately devised a plan for keeping my JOURNALS clean and handy which may interest some of your readers, viz.: Remove the inside ledge or strip of straw-board from capcine plaster boxes, when each box will hold just one volume. These I keep on a shelf, upright, with the year marked on a label on the back. Will some craftsman tell us an equally cheap and effective means of preserving the "Druggists' Circular?"

Respectfully,

THOS. D. McELHENIE.

THE CONVERSION OF MORPHIA INTO CODEIA.

BY E. GRIMAUX.

The formula of morphia, $C_{17}H_{19}NO_3$, and that of codeia, $C_{18}H_{21}NO_3$, show that these two bases differ from each other by CH_2 , and that codeia can be considered as a devivative from morphia by the substitution of a CH_3 group for one atom of hydrogen. In 1853, How, an English chemist, tried the action of iodide of methyl upon morphia and codeia; but he obtained an isomer of hydriodate of codeine, not presenting any characters of an alkaloidal salt, not precipitated by ammonia or potash, and behaving like a quarternary iodide of ammonium.

More recently, Matthiessen and Wright have defined the relation between morphia and codeia. By heating morphia with hydrochloric acid they removed from it the elements of water and converted it into apomorphia; codeia, submitted to the same treatment, yielded also apomorphia and besides chloride of methyl. They have therefore admitted the existence in morphia of an alcoholic group (HO) and in codeia that of a group (OCH_3); but nothing indicated the possibility of the passage from one base to the other.

In considering the various reactions of morphia, its reducing properties, its solubility in potash, lime water and baryta water, and the coloration that it takes with ferric salts, I thought that it approached the phenols in its characters. Morphia might be a body having complex functions, containing at least one phenolic hydroxyl, and codeia would then be the methylic ether of morphia considered as a phenol.

In order to attempt this conversion it only remained to apply the known process of heating morphia with alcoholic potash or soda and iodide of methyl.

Upon taking 1 mol. of morphia, dissolved in alcohol containing 1 mol. of soda, adding 2 mol. of iodide of methyl and heating the mixture gently, a brisk reaction was observed, which terminated in a few moments. The phenomenon occurred as expected, but it was complicated by a secondary reaction. Instead of free codeia, iodo-methylate of codeia, $CH_3I, C_{17}H_{18}NO_2(OCH_3)$, was obtained to the extent of 85 per cent. of the theoretical yield. At the same time there was a double decomposition between the iodide of methyl and the morphia-soda, another part of the iodide of methyl being fixed directly upon the molecule.

The body so obtained is absolutely identical with the addition product of codeia and iodide of methyl, with which it has been carefully compared. It is nearly insoluble in alcohol. It is soluble in boiling water, from which it separates in two different forms, according to the conditions of crystallization: upon cooling slowly, in hard, transparent, anhydrous, rather voluminous crystals; upon cooling rapidly, in fine silky needles containing water of crystallization.

To obtain free codeia it is necessary to employ one-half the above quantity of iodide of methyl. In exhausting the product of the reaction with ether, codeia is removed, but the yield is very small; 20 grams of morphia gave only 2 grams of hydrochlorate of codeia. In consequence of the great tendency of iodide of methyl to become fixed upon alkaloids, the larger portion combines with the morphia to form iodo-methylate of morphia-soda, whilst a small quantity only reacts by double decomposition. It is easy to prove that this is what takes place; for after having removed the codeia with ether, iodo-methylate of morphia can be extracted from the residue, or by treatment with a fresh quantity of iodide of methyl it may be converted into iodo-methylate of codeia.

The codeia was purified by the ordinary process: conversion into hydrochlorate, decomposition of this salt by potash and crystallization from anhydrous ether or dilute alcohol.

It presented then all the characters of codeia extracted from opium; the centesimal composition, the fixed melting point at 153°C ., its solubility in water, alcohol and ether, the nature of the salts which are precipitated by potash, and not by ammonia or the alkaline carbonates, and, finally, the crystalline form, which has been determined by M. Friedel.

The determination of the rotatory power of codeia prepared with morphia-soda and iodide of methyl has been made comparatively with that of the rotatory power of codeia extracted from opium. An alcoholic solution of artificial codeia, 1 in 77, showed with a length of 22 millimeters a deviation to the left of 3.7° , which would be equal to a molecular rotatory power of $(a)_D = -130.34^{\circ}$. Under the same conditions natural codeia showed a left-handed rotation of 3.783° , which gives $(a)_D = -133.18$.

The small quantity of material operated upon did not allow of greater precision being attained; nevertheless these figures are suffi-

cient to confirm afresh the identity of the two codeias, already demonstrated by an investigation of the crystalline form and chemical properties.

The difficulty in obtaining considerable yields of codeia arises, as mentioned, from the rapidity with which the iodide of methyl unites by addition to the morphia and codeia. In trying the action upon these bases of iodide of ethyl, I found that this only unites directly with extreme slowness. It therefore seemed probable that if iodide of ethyl were made to react upon morphia-soda, an ethylated morphia would be obtained, homologous with codeia, of which the yield would be more advantageous, and this in fact was what occurred.

In operating with iodide of ethyl, in the same way as previously with iodide of methyl, there was extracted a new base, $C_{19}H_{23}NO_3$, a homologue of codeia, which represents the ethylic ether of morphia considered as a phenol; the yield was from 40 to 45 per cent. of the morphia used. The new base was obtained crystallized with 1 molecule of water, in beautiful hard brilliant lamellæ, a little less soluble in boiling water than codeia (requiring 35 to 40 times its weight of water), very soluble in ether and in alcohol. It fuses at $83^{\circ}C$. into a limpid liquid which does not crystallize upon solidifying, but forms a colorless transparent vitreous mass; at $100^{\circ}C$. it undergoes alteration, becoming brown; it is precipitated from its salts by potash and the alkaline carbonates, but is not precipitated by ammonia. The hydrochlorate occurs in fine needles grouped in mamelons.

Codeia is therefore a methylic ether of morphia, and from morphia may be obtained a series of new bases, of which codeia is the type and morphia the substratum, as numerous as the series of ethers of an alcohol.

These bases being analogous to codeia, I would propose to give them the generic name of codeines; these codeines would be the ethers of morphia. The methylic ether is the codomethyline, or, more simply, the codeine; the homologue just described is the ether of the ethylic series, codethyline.

I intend to prepare some other bodies of this series, which it appears to me should furnish subjects of investigation interesting to physiologists, and perhaps new resources for therapeutics. M. Bochefontaine has experimented with codethyline and found that it is toxic in small doses and has a tetanizing action. It is to be observed that this base,

$C_{19}H_{23}NO_3$, differs by two atoms of hydrogen more from thebaine, of which Claude Bernard demonstrated the tetanizing power.—*Pharm. Jour. and Trans.*, July 16, 1881; *Comptes Rendus*, vol. xcii, May 16, 1881.

INULIN.

BY H. KILIANI.

The author at the outset alludes to the discordant results of former researches on inulin and to the necessity of a fresh study of its properties and chemical relations. In order to prepare it, roots of the *Dahlia variabilis* and *Inula helenium* were boiled with water in the presence of sodium carbonate. The liquid obtained was cooled by a freezing mixture, and the separated precipitate was dissolved in hot water, filtered, and again exposed to a freezing mixture. After repeating this process three or four times, the inulin is obtained perfectly white and is subsequently purified from levulose by absolute alcohol, and finally dried over sulphuric acid.

Inulin obtained in this way is a white powder resembling starch: by slow evaporation of an aqueous solution it forms "crystal spheres," as observed by Sachs and Prantl ("Jahresb.," 1870, 849). It is insoluble in absolute alcohol, sparingly soluble in dilute alcohol and cold water, but very soluble in hot water. The author has confirmed the formation of a gum-like and horny modification of inulin; the latter the author considers to be a highly hydrated inulin, which is converted into solid lumps of inulin in the same way that ferric hydrate and silicic acid are converted into their corresponding anhydrous oxides. Its specific gravity is 1.3491, and its optical rotatory power, as determined with a Wild's polaristrobrometer $[\alpha]_D = 34.6$ to 36.4 , gives results agreeing with those of Lesœur and Morelle ("Jour. Chem. Soc.," 1878, 970). The author assigns to inulin the composition $C_{36}H_{62}O_{31}$ ($=6C_6H_{10}O_5 + H_2O$); he has also confirmed the observations of others that inulin, when heated with water in sealed tubes at 100° , is converted into a sugar which resembles levulose in chemical and physical properties. When oxidized with dilute nitric acid, inulin yields formic, oxalic, racemic, glycollic and probably glyoxylic acids. The author finds that glycollic and saccharic acids alone are formed when dextrin is oxidized with dilute nitric acid.

Inulin is slowly oxidized by long contact with bromine in sealed

tubes, with formation of bromoform and carbonic and oxalic acids; the hydrobromic acid formed in the reaction converts the unchanged inulin into levulin. This latter, by the further action of bromine, gives the same products as inulin. By heating the brominated liquid with silver oxide, some of the unchanged levulose is converted into glycollic acid. As this acid is formed by the direct action of bromine and silver oxide, it is possible that the inulin is converted by the bromine into levulose, which is then oxidized by the silver oxide into glycollic acid; for comparison the author has studied the action of bromine and silver oxide on dextrose, and finds that no oxalic, but only gluconic acid is formed, according to the equation $C_6H_{12}O_6 + O = C_6H_{12}O_7$. Glycollic acid is formed as a secondary product of the action of silver oxide on the gluconic acid. By distillation of inulin with hydriodic acid, a small quantity of an oil containing iodine is obtained, but its constitution could not be ascertained, as it readily decomposed. By the action of nascent hydrogen on inulin (sodium amalgam and water) neither mannitol nor mannitan is formed. Pure inulin reduces ammoniacal silver solution and gold chloride, but not Fehling's solution nor gold nor platonic chloride.

When inulin is heated with baryta water it is partly converted into fermentation lactic acid. By inversion, inulin is not converted at ordinary temperatures nor at $40^{\circ}C$. into levulose (Barth, "Ber.," 11, 474; 1878, 591). It appears from these properties that inulin stands in near chemical relation to levulose, and is probably its anhydride. This is shown by the readiness with which it takes up water in many reactions, being converted into levulose. It, however, differs from levulose by not reducing Fehling's solution, and not undergoing fermentation with yeast, and not forming an additive compound with hydrogen. Levulose, the hydrate of inulin, differs from dextrose in its oxidation products with nitric acid and bromine water; the former gives glycollic and oxalic, the latter gluconic acid. This difference may be simply explained by supposing dextrose to be the aldehyd whilst levulose is the ketone of mannitol.—*Jour. Chem. Soc.*, May, 1881; *Annalen*, 205, 145-190.

THE GROWTH OF *CROCUS SATIVUS*, THE SOURCE OF HAY SAFFRON, IN KASHMIR.

BY DR. DOWNES, Medical Missionary.

Paper read before the Edinburgh Botanical Society, May 12. From the "Gardeners' Chronicle," May 21, 1881.

According to the late Dr. Elmslie, the native names are Kóng-pósh (*Crocus sativus*), n.m. saffron-flower, and Kóns, n.m. saffron (*Crocus sativus*). Cake saffron is largely an adulteration of the stigmata of wallflower and other plants. The *Crocus sativus* is the only plant grown in Kashmir the stigmata of which compose hay saffron. The famous saffron fields are situated in the vicinity of Pampur, on a plain fully fifty feet above the valley. The bulbs grow on soil said to have been specially imported for the purpose. In dry seasons the produce averages nearly a ton, though the crop was in 1871 only half that quantity. Some 1,500 lbs. of saffron are exported yearly from Kashmir to Laddahk. From 9d. to 1s. sterling is given for 180 grains. The bulbs are planted out in June, and the stigmata are collected in October. It is principally used as a condiment, its power on the system, whether in health or disease, being trivial. The mark on the forehead of a Hindu Pundit is partially derived from it. The Mussulmans of the valley are generally unable to buy it. According to O'Shaughnessy the odor is fragrant, and the taste bitter but agreeable. It tinges the saliva yellow. Pereira makes one grain of good saffron to contain the stigmata and styles of nine flowers, so that the formation of an ounce would require 4,320 flowers. Bulbs received by Dr. Royle in 1826 from Kashmir, when in charge of the Saharunpore Botanical Gardens, which flowered, and were afterwards figured, turned out to be varieties of *Crocus sativus*. This author has little doubt of the Asiatic derivation of this species.

The four stations of saffron cultivation, called "Warewas," are flat treeless table lands, on the borders of the hills, 50 to 150 feet higher than the Kashmir Valley, which is 5,200 feet above the sea-level. They are little, if at all, irrigated. The soil is a stiff clay. Dr. Downes has been informed that saffron has been successfully cultivated in the gardens of the city of Kashmir; indeed, he believes that the oppression and greed of government officials is the sole cause preventing its general growth. He does not think a special soil needed for the cultivation of *Crocus sativus*. In a hopeful experiment of this kind at Alwar, near Delhi, Mr. Landseer started bulb growing on earth brought in barrels from Kashmir. But in the second year the five beds of bulbs

had increased to nine, and as there was no further import of Kashmir earth, native soil had to be partly used, and with success. In Kashmir the *C. sativus* is cultivated on raised parterres, and drained and carefully weeded; though Dr. Downes believes not irrigated. As the half of the price of the produce, which is the due of the cultivator, very seldom comes his way—owing to the plundering of intermediate government officials—the plant is left very much to its own care. During the last two famine years no saffron has been gathered, though this year a small crop is expected. According to one native tradition, the *Crocus sativus* miraculously appeared in Pampur, after the prayer of a holy man some three hundred years ago; while others assert its introduction from the direction of Kabul by a ruler named Bar-Sháh. —*Phar. Jour. and Trans.*, July 2, 1881.

PHARMACEUTICAL NOTES.

BY R. DE PUY.

I send the following formula and notes as being eminently practical, having proved always successful in my hands. I trust they may be so in the hands of other pharmaceutical brethren.

Citrine Ointment.—Mercury 4 ounces, nitric acid C. P. 12 fluid-ounces, neatsfoot oil 8 fluidounces, lard $2\frac{1}{2}$ pounds. Dissolve the mercury in the acid. Heat the lard and oil to 180° , then add the dissolved mercury all at once. Commence stirring and continue doing so until the ointment is cold or about of the consistency of molasses. Towards the latter end of the process the vessel may be set in one containing cold water, thus hastening the cooling. I wish to impress it firmly upon the minds of all trying this process that it is absolutely necessary to continue the stirring until the completion of the process. The above gives an ointment of good consistency, bright lemon color, without disagreeable smell and keeps well.

Filtering Paper Pulp.—I noticed some time ago a query regarding a practical method for preparing paper pulp, and offer the following:

Place any amount of paper (filtering paper is not necessary, though it is the best) in a mortar or other vessel, upon which pour enough liq. sodæ or potassæ to very thoroughly wet it, stir it with a pestle or a stick until it is reduced to a pulp, which will only take a minute or two, then add cold water, stir, throw upon a calico filter, let drain and wash with water till all traces of the alkali are washed out. By this

process any amount of pulp can be prepared in a very few moments, and can be put in wide-mouthed jars for future use.

Washing Precipitate.—This process I have only used on precipitates of iron, but have no doubt but that it will work on any precipitate equally well. After forming my precipitate, I pour it, supernatant liquid and all, in what is known as a two-bushel bag; this, after folding over the top, I put into an ordinary drug press and apply a very gradual pressure until the greater portion of the liquid is pressed out, being careful not to press too hard, for if too much pressure were applied it would cake and be difficult to wash. The washing is performed simply by a repetition of the above, adding water, stirring in the bag and pressing. By the above I can prepare a precipitate in nearly as many minutes as it takes hours in the ordinary way of decantation, etc.

Elixir of Gentian and Chloride of Iron.—If extract of gentian, prepared after the formula of the U. S. P. be used in making this elixir, no difficulty will be experienced, whether employing the so-called tasteless tincture of iron or the ordinary tincture.—*Canad. Phar. Jour.*, August, 1881, pp. 3, 4.

VARIETIES.

HOW MILK SHOULD BE TAKEN.—Milk is a food that should not be taken in copious draughts like beer, or other fluids, which differ from it chemically. If we consider the use of milk in infancy, the physiological ingestion, that is, of it, we find that the sucking babe imbibes little by little the natural food provided for it. Each small mouthful is secured by effort, and slowly presented to the gastric mucous surface for the primal digestive stages. It is thus gradually and regularly reduced to curd, and the stomach is not oppressed with a lump of half-coagulated milk. The same principle should be regarded in the case of the adult. Milk should be slowly taken in mouthfuls, at short intervals, and thus it is rightly dealt with by the gastric juice. If milk be taken after other food, it is almost sure to burden the stomach, and to cause discomfort and prolonged indigestion, and this, for the obvious reason that there is insufficient digestive agency to dispose of it. And, the better the quality of the milk, the more severe the discomfort will be under these conditions.—*Dr. Dyce Duckworth in Popular Science Monthly for August.*

FOREST CULTURE.—Probably fifty years hence there will be abundance of trees in the West. Agriculturists are rapidly awaking to the necessity of planting them. The Fort Scott and Gulf Railroad Company has begun

the planting of hundreds of acres of trees on its lands. A Boston capitalist has engaged a company of raisers of forest seedlings in Illinois to break and plow a large area in Kansas, and plant no less than 2,720 trees to the acre, and cultivate these until they shade the ground. At the end of that time—say ten years—the plantations will be delivered over to the owner. No trees less than six feet high are to be counted. The Fort Scott Railroad has adopted this plan, one advantage of which is that the tree enterprise will be attended by experienced men, whose interest it will be to make as much of a success of it as possible.—*Manuf. and Builder*, June.

RESORCIN IN CHOLERA INFANTUM.—Totenhoffer ("Breslauer ärztliche Zeitschrift," No. 24) claims this substance does not act like carbolic acid as an irritant, or lead to collapse. He finds that it diminishes vomiting and diarrhoea and restores the function of the stomach. The commencing dose should be one and a half grain in some slightly bitter menstruum. Recovery under its use usually occurs within a week. The mortality of cholera infantum under treatment by it has been but fifteen per cent.—*Chicago Med. Review*, April 5.

SALICYLATED CAMPHOR.—Drs. Henrot and Luton ("L'Union Médicale et Scientifique du Nord-Est") give the results of the employment of this substance. Used under the form of pomade, against phagadenic ulcers, lupoid and syphilitic, it has proved of great value. Henrot is of opinion that salicylated camphor is likely to prove of service in certain epitheliomata, particularly of the cervix uteri, and that in certain non-malignant ulcers of that organ it will undoubtedly be of the greatest value.—*Chicago Med. Review*, 1881, p. 134.

IMPOTENCE FROM SALICYLATE OF SODIUM.—Dubrisay reports three cases of young, vigorous men, in whom very marked impotence of temporary duration was produced by taking forty-five to fifty-grain doses of salicylate of sodium for twenty days while under treatment for rheumatism.—*L'Abeille Méd.*, *La Presse Méd. Belge*; *Buffalo Med. and Surg. Jour.*, June.

SALICYLATE OF SODIUM AS A REMEDY IN NERVOUS HEADACHE.—Dr. Æhlschläger, of Danzig, says, in "Allgemeine Medicinische Central Zeitung," May 7, 1881, that he has found this remedy of great value in the treatment of nervous headache, especially if given in a dose of one gram (gr. xv.) in the beginning of an attack. It usually produces drowsiness, and after a few hours the patient wakes up refreshed and free from pain. It, however, often fails to produce this effect in cases dependent on anæmia.—*Med. and Surg. Rep.*, July 16, p. 79.

WINTERGREEN AS AN ANTISEPTIC.—From the fact that the best salicylic acid is obtained from wintergreen oil, it is scarcely surprising to learn that Gosselin and Bergeron ("Archives Générales," January, 1881) have found that wintergreen is almost as antiseptic as carbolic acid. They have used two alcoholic solutions of varying strength; the stronger is composed of five parts oil of wintergreen, one hundred parts alcohol and fifty parts

water; the weaker, of two and a half parts of oil of wintergreen, one hundred alcohol and one hundred water. No toxic effect or caustic action resulted from the use of these solutions. It is probable that while the cost of this antiseptic solution may be as claimed by Gosselin and Bergeron, still physicians engaged in rural practice may find in the use of these alcoholic solutions of wintergreen oil an economical means of practising antisepticism, as wintergreen is an exceedingly common plant east of the Mississippi river.—*Chic. Med. Rev.*, May 5.

OIL OF CAJEPUT IN ECZEMA.—Dr. Claiborne ("Gaillard's Medical Journal," April, 1881) claims to have secured very good results from the use of the oil of cajeput in infantile eczema. The drug was used in the form of a lotion composed of oleum cajeput four drachms, sapo viridis four drachms and alcohol two ounces, with which the eczematous patches were washed at least once a day. An ointment composed of two ounces of oxide of zinc ointment and two drachms of oil of cajeput was kept locally applied to the eczematous patches. The oil of cajeput has often been used in other dermatoses, though without much effect, but this is perhaps the first contribution to its use in any form of eczema.—*Chic. Med. Rev.*, May 5.

ERGOTIN IN CHRONIC ECZEMA.—Dr. Lassar (quoted in "International Journal of Medicine and Surgery," March 10, 1881) claims that there exists in patients afflicted with eczema a morbid condition of the vasomotor nerves, which results in frequent spasms of long duration, and against this he has used ergotin internally with very good results. He has prescribed it for patients who had been under every form of treatment for a decade, with great success. Externally he chiefly relied on the oleum cadini (1 to 10). The average length of the treatment of eczema had been much reduced since the internal use of ergotin.—*Chicago Med. Review*, April 5.

NEW METHOD OF APPLYING CROTON OIL.—A new method of applying croton oil to ringworm, etc., has been described by Dr. Ladreit de Lacharrière. He uses a mixture of one hundred parts of croton oil with fifty parts of wax and fifty of cacao butter, and makes it into sticks like cosmetic by the aid of a mould, so as to apply it with great accuracy both as to extent and depth.—*British Med. Journal*; *Louisv. Med. News*.

CHAULMOOGRA AND GURJUN OIL IN LEPROSY.—John D. Hillis, F.R.C.S.I., West Indies.—I have tried, and with much success, chaulmoogra oil in true leprosy. I give it internally in doses commencing with ten minims in emulsion with milk; and externally I apply a liniment of one part of chaulmoogra to fifteen of olive oil to the eruption, the diseased nerves or the tubercular surfaces. I find that the oil causes constipation; and in consequence I am in the habit of administering it with castor oil.

I have, however, obtained much better results at the General Leper Asylum with gurjun oil—wood oil. The cases in which gurjun oil has failed have either been too far advanced or with hereditary taint, or where the disease had been preceded by small pox, syphilis or yaws (framboesia); these are much less amenable to treatment.—*N. Y. Med. Abstract*.

KAVA KAVA IN GONORRHOEA.—Dr. French has recently prescribed this remedy with great success in gonorrhoea in conjunction with other remedies, as follows: R Ex. fl. eucalyptus $\mathfrak{z}\text{ii}$, ex. fl. kava kava $\mathfrak{z}\text{vss}$, acid benzoic $\mathfrak{z}\text{ss}$, pulv. acid boracic $\mathfrak{z}\text{iii}$. M. S. $\mathfrak{z}\text{i}$ ter in die. Kava kava has recently been shown by Dupuy to be a sialogogue, bitter tonic, mild excitant of the nervous system, diuretic and blenostatic. It is, however, probable all the supposed virtues of this plant depend on the oleoresin which directly affects the mucous membrane like other oleoresins.—*Chic. Med. Rev.*, 1881, p. 123.

EUCALYPTUS IN CHRONIC DISEASES OF THE STOMACH.—Dr. Charles James Fox has successfully treated the diseases mentioned with tincture of eucalyptus in doses of $\mathfrak{z}\text{i}$ twice a day, continued for a few weeks, or if necessary, several months.

In a class of cases of symptoms of ulcers of the stomach, threatening perforation, he has found that a strict regimen and light diet, conjoined with the use of the drug, exempted the patient from the recurrence of attacks.—*Medical Bulletin*, April.

POULTICE OF JABORANDI.—Cases of mammary inflammation are successfully treated by Dr. H. B. Stehman with a poultice composed of two parts flaxseed meal and one part crushed jaborandi leaves, the latter infused in a quantity of hot water necessary to make the poultice of the proper consistency; a diaphoretic mixture is given at the same time.

In mumps this treatment proved equally gratifying, and in the inflammatory stages of buboes the poultices prevented suppuration.—*Lancaster Med. Soc. Trans.; Med. and Surg. Reporter*, June 25.

PAPAIN FOR TÆNIA.—In the "Lyon Médical" M. Bouchut reports that he has used papain, or vegetable trypsin, as well as animal pepsin, as a vermifuge, and he states that he not only finds it more active, but that he has relieved several children by its means. After its use a child had passed yellow softened segments of tapeworm, twenty-five centimeters long, and in a partially digested state. These facts, taken with those which have been derived from the colonies in which the juice of carica papaya has been successfully used for worms, go far to prove that this new remedy will in future be of service as an anthelmintic.—*Med. and Surg. Rep.*, July 30.

ODOFORM AS A VERMIFUGE.—Dr. F. L. Sim has found iodoform very serviceable in case of tænia. It was given in one grain doses three times a day until segments of the worm had been found in the stools for several days, when a drachm of oleoresin of male fern, followed by a brisk cathartic four hours later, afforded complete relief.

Against needle worms (*oxyuris vermicularis*) a suppository of 7 grains iodoform was first used on account of the itching about the rectum and anus. Afterwards, iodoform gr. i three times daily was given. After four days the worms began to pass and were found in every stool for six days.—*Miss. Vall. Med. Monthly*, May.

BROMIDE OF ETHYL IN EPILEPSY AND HYSTERIA.—Olier and Bourneville ("L'Union Medicale") recently reported to the French Biological Society the results of two months' experimentation with bromide of ethyl on epileptic and hysterical patients.

In the hysterical cases they found that the remedy, administered at the beginning of the attack, completely checked the convulsions. In the epileptics, on the attack coming on during a tonic period, the bromide of ethyl appeared to act sometimes in such a way as to suppress the convulsions and produce complete muscular relaxation; often the attack was diminished in intensity and duration; sometimes the remedy was without effect.—*Chicago Med. Review*, 1881, p. 134.

APOCYNUM CANNABINUM IN ANASARCA.—Bright's disease is becoming the fashionable disease to study, more especially since Charcot, who sets the fashion for many physicians in the United States, has been paying much attention to it; these symptoms have been chiefly pathological and symptomatological. However, many independent observers have dealt with it from the therapeutical aspect, and Dr. J. S. Dabney (New Orleans "Medical and Surgical Journal," Feb., 1881) has found, he claims, that apocynum cannabinum is one of the best diuretics and hydragogue cathartics that can be employed in the disease, as it causes not only marked diminution of the anasarca, but also decrease in the albumen and casts. He claims for it certain advantages: First, a small quantity only is necessary to produce diuresis, emesis or catharsis. Second, it has an agreeable aromatic taste. Third, it has tonic properties. Fourth, its harmlessness, free emesis resulting from an overdose. While many of these claims seem rather strained, still there appears to be but little doubt that the remedy is of much value in ascites, anasarca and allied conditions.—*Buffalo Med. and Surg. Jour.*, June; *Medical Review*.

DESICCATED OX BLOOD AND HEMOGLOBIN.—Dr. Le Bon says that desiccated ox blood and hemoglobin has been thoroughly tried in the Paris hospitals and found very efficacious in debilitated patients. It is indicated in those cases that require raw meat, iron or the phosphates. The elixirs or wines sold as containing the essential principles of blood or meat are of comparatively little value, and are devoid of the nutritive properties contained in the albuminoid principles which are so essential.—*St. Louis Courier*, April, p. 327; *Med. Times and Gazette*.

PEPSIN.—Dr. L. Wolff has tested samples of Dr. Carl Jensen's pepsin and found that one grain of it dissolved in a little water, by the aid of 32 drops of hydrochloric acid, C P., and diluted with 6 ozs. water, after acting for four hours at a temperature of 103° F. on 760 grains coagulated white of egg, well comminuted, left an undissolved residue, which appeared much softened and semi-translucent, weighing 180 grains, thus proving its digestive power to be 1 to 580. The solution of white of egg so obtained possessed the characteristic color of fresh peptones, was yellowish and slightly opaque; it did not coagulate on boiling, nor on the addition of alcohol or an alkali.—*Med. Bulletin*, May, p. 120.

SUGAR OF MILK AS A LAXATIVE.—A writer in the "*Deutsche Med. Wochenschrift*" recommends sugar of milk as an efficient and agreeable laxative. He gives from quarter to half an ounce in half a pint of warm water, or of milk and water, fasting, in the morning.—*Med. and Surg. Rep.*, July 30.

ACTION OF CONINE.—Dr. Bouchefontaine recently reported ("*Bulletin générale de Thérapeutique*") before the Académie des Sciences some experiments which proved, he claimed, that conine first acted on the nerve centres themselves before affecting the nervous connective substance between the nerves and muscles. In the dog and the batrachians the alkaloid ends by completely decreasing the nervous motor excitability if given in sufficient quantity, but is then fatal to both classes of animals. These results fully accord with clinical experience, for it has frequently happened that cases of acute mania and progressive paresis in which delusions existed based on the motor disturbance, have had both removed by the use of sufficient doses of either the alkaloid or the fluid extract of the drug which has calmed the motor excitement, thus removing the delusions and preventing the establishment of a vicious circle which would soon exhaust the patient.—*Chic. Med. Review*, 1881, p. 132.

SUGGESTIONS IN TOOTHACHE.—At the last meeting of the Odontological Society, of Great Britain, Mr. Stocken read a paper on "The Value of Certain Remedies in the Constitutional Treatment of Inflammatory Conditions of the Vascular Tooth-Structure, and of Neuralgia arising therefrom." The remedies to which Mr. Stocken specially directed attention were chloride of ammonium, sulphide of calcium and gelsemium. He had selected them because their action was not so generally known as that of many other agents. He gave a full description of the therapeutic effects of these drugs, indicating the class of cases in which each would be likely to be most serviceable. His conclusion was that, in simple neuralgia of the fifth pair, gelsemium, either with or without aconite, would effect a cure or, at least, afford considerable relief. If the pain was due to congestion or inflammation of the pulp or periosteum, he would prescribe also chloride of ammonium. While in chronic periostitis with suppuration, sulphide of calcium gave results which were in the highest degree satisfactory, cutting short the attacks in the most remarkable manner. He was of opinion that dental surgeons do not generally give sufficient attention to the constitutional treatment of the cases under their care.—*Med. and Surg. Rep.*, June 4.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

ALBANY COLLEGE OF PHARMACY.—The Board of Governors of the Union University, at Albany, N. Y., have organized a department of pharmacy under the above title. The lectures will be held in the Albany Medical College building, and the course of instruction will be divided into a junior and senior class. The faculty consists of Jacob S. Mosher, M.D., Professor of Botany and Materia medica; Willis G. Tucker, M.D., Professor of Chemistry, and Gustavus Michaelis, Professor of Pharmacy.

ILLINOIS PHARMACEUTICAL ASSOCIATION.—The annual meeting which was to be held at Peoria Nov. 8th will be held there Oct. 18th, the change having been found desirable and necessary for various reasons.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Clinical Lectures on the Diseases of Old Age. By J. M. Charcot, M.D., Professor in the Faculty of Medicine of Paris, etc. Translated by Leigh H. Hunt, B.Sc., M.D., etc.; with additional lectures by Alfred L. Loomis, M.D., Professor of Pathology and Practical Medicine in the Medical Department of the University of New York. New York: William Wood & Co., 1881. 8vo, pp. 280.

Coulson on the Diseases of the Bladder and Prostrate Gland. Sixth edition. Revised by Walter J. Coulson, F.R.C.S., Surgeon to St. Peter's Hospital for stone, etc. New York: William Wood & Co., 1881. 8vo, pp. 393.

The above works are Nos. 6 and 7 of Wood's Library of Standard Medical Authors. The first one contains 21 lectures by Professor Charcot, of which the first is devoted to the general characteristics of senile pathology and the second to the febrile state in the aged. The following 16 lectures treat of the various forms of gout and rheumatism, their pathology, symptomatology, etiology and treatment. The remaining three lectures are on the clinical importance of thermometry in old age. These are followed by ten lectures by Prof. Loomis on other senile diseases, namely, pneumonia, chronic catarrh of the bronchii, asthma, atheroma, fatty heart, cerebral hemorrhage, apoplexy, cerebral softening, chronic gastric catarrh, constipation and hypertrophy of the prostrate gland.

The second work opens with a chapter on general anatomical and physiological considerations, followed by another on the method of examining the bladder and prostrate gland. The remaining chapters treat of the abnormalities, injuries and diseases of the bladder and their treatment, about 160 pages being devoted to calculi and their removal, including the preventive treatment. The last four chapters are devoted to the diseases of the prostrate gland.

Both works are well gotten up, illustrated with the necessary good woodcuts, and each is supplemented with a copious index for ready reference.

The Compend of Anatomy. For Use in the Dissecting Room and in Preparing for Examinations. By John B. Roberts, A.M., M.D., Lecturer on Anatomy and Operative Surgery in the Philadelphia School of Anatomy, etc. Second edition; revised. Philadelphia: C. C. Roberts & Co., 1881. 12mo, pp. 198.

The subject matter of this little work is divided into chapters on bones, articulations, ligaments, muscles, the vascular system, the nervous system, organs of digestion, circulation and respiration, urinary and genital organs and organs of sense. The material appears to be well prepared for practical use in the dissecting room, and to supply the notes and memoranda which the student would wish to make during lectures on anatomy.

Trichinæ (Pork Worms or Flesh Worms). How to Detect them and how to Avoid them. By John Phin. Rochester: Bausch & Lomb Optical Company, 1881.

A small pamphlet containing a popular account of trichinæ, their habits, modes of propagation and means of dissemination, etc.

Proceedings of the Third Annual Meeting of the New York State Pharmaceutical Association, held in Buffalo May 18th and 19th, 1881. Elmira, N. Y. 8vo, pp. 192.

The first 112 pages contain the minutes, which are followed by the report of the Committee on Pharmacy, and by the following papers read at the meeting: emulsions of mucilage of Irish moss and fixed oils, by A. B. Huested; vaselin in the preparation of ointments, by G. H. Arnold; concentrated infusions and decoctions, by E. G. Bissell; therapeutic value of pills, by C. W. Holmes, and three papers by Prof. Bedford, on benzoic acid of commerce, benzoate of sodium and pharmaceutical literature.

The next meeting will be held in Albany, June 20th, 1882.

Die Naturgeschichte des Cajus Plinius Secundus. Leipzig: Gressner & Schramm. Price, per part, 2 marks.

This is Part 6 of the Natural History of Cajus Plinius, translated into German by Prof. Dr. G. C. Wittstein, and by him supplied with explanatory notes.

OBITUARY.

MATHIAS JACOB SCHLEIDEN died at Frankfort-on-the-Main June 23d, in his 78th year. He was born at Hamburg April 5th, 1804, studied and afterwards practised law for several years. Subsequently he studied natural history and medicine, and in 1839 became Professor of Botany at Jena, where he lectured also on pharmaceutical botany and pharmacognosy in the Pharmaceutical Institute, of which Wackenroder was director at the time. He was one of the first who recognized the necessity of the use of the microscope in the study of the vegetable drugs as well as of the development of plants. After severing his connection with Jena, in 1862, he went to Dresden and for a short time to Dorpat, occupying in the latter place the chair of phytochemistry and anthropology. Since 1864 he has lived at Dresden or Frankfort, devoting himself to philosophical studies and publications. His most important works for the pharmacist are the outlines of scientific botany, medico-pharmaceutical botany and botanical pharmacognosy. His popular works on the plant and its life, the rose, tree and forest and others have been translated into several languages. Schleiden was an exact critical and philosophical investigator, his observations always commanding the careful consideration of scientists throughout the world.